INCOME, EMPLOYMENT AND PUBLIC POLICY

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ESSAYS IN HONOR OF ALVIN H. HANSEN

BY

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Prefatory Note

FEW AMERICAN economists have influenced economic thinking and policy in our time as has Alvin Hansen. As a teacher and thinker he combines searching theoretical work with realistic analysis of the basic issues of economic policy. His explorations in the determinants of income and employment, his grasp of social institutions and his never-tiring enthusiasm for new problems and new approaches are a propelling force to his students and to economic thinking here and abroad. His is a search for the good society in which individual freedom may be combined with economic stability, peace, and security—with economic analysis a tool of leadership towards this end.

Most of us were his students while the remainder have been his close associates. With affection, admiration, and gratitude we offer these essays to Professor Hansen at the way station of his sixtieth birthday.

The Contributors

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PART ONE

Determinants of Income

I

Three Lags in the Circular Flow of Income

BY

LLOYD A. METZLER

I. INTRODUCTION

THE THEORY of employment was first presented as a static theory of equilibrium, and this no doubt accounts for much of the confusion and controversy which occurred in its formative years. The disputes over the definitions of saving and investment, and whether the two are necessarily equal, could largely have been avoided had a more careful distinction been made, at the outset, between the equilibrium of income and movements about this equilibrium. In retrospect, it is perhaps surprising that the static theory should have been the source of so many differences of opinion, since, in another field, the field of price theory, economists were thoroughly accustomed to dealing with static relations and to distinguishing between the equilibrium itself and movements about this equilibrium. No economist, for example, would have said that the equality of purchases and sales of a particular commodity indicates that the price of that commodity is in equilibrium. And yet the equality of saving and investment over a given past period, which has no more significance in income theory than the equivalence of purchases and sales in price theory, created serious doubts as to whether the saving-investment relation could be used as a condition of equilibrium.[1]

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[1] See G. Haberler, "Mr. Keynes' Theory of the 'Multiplier': A Methodological Criticism," *Zeitschrift für Nationalökonomie*, Vol. 7, 1936, pp. 299–305. Reprinted in *Readings in Business Cycle Theory*, Phila., 1944.

In the end, the controversy was resolved by distinguishing between actual saving and investment and the amounts which savers would like to save, and investors would like to invest, if income were maintained at the existing level over a considerable period of time. In other words, a distinction was made between actual investment and intended investment, and between actual saving and intended saving.[2] It was then found that the condition of equilibrium of income is the equality of intended saving and intended investment. If intended investment over a given period exceeds intended saving, income in subsequent periods rises; and, conversely, if intended saving exceeds intended investment, income falls. These conclusions may easily be demonstrated by showing how producers or income earners react to a discrepancy between actual and intended investment, or between actual and intended savings. If intended investment exceeds intended savings, for example, the discrepancy may be due to the fact that producers as a group have experienced an unforeseen reduction of inventories, and actual investment therefore has fallen short of intended investment. If so, the level of output and income in later periods will be increased, both to replace depleted stocks and to meet the higher level of demand which brought about the initial reduction of stocks.

The difference between intended saving and intended investment may also be due, however, to the fact that income earners, for one reason or another, are temporarily saving a larger part of their incomes than they would if income were maintained at the present level. In this case the subsequent rise of income will be brought about by an increase of consumption, with a corresponding increase in output. Thus whatever the cause of the discrepancy, an excess of intended investment over intended saving leads to a rise of income. And conversely, it may be shown that an excess of intended saving over intended investment leads to a fall of income.

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[2] Although the Swedish economists did not use the terminology suggested above, the distinction between planned and unplanned (or intended and unintended) components of saving and investment is their principal contribution to the theory of employment. See B. Ohlin, "Some Notes on the Stockholm Theory of Saving and Investment," *Economic Journal*, Vol. 47, 1937, Part I, March, 1937, pp. 53–69; Part II, June, 1937, pp. 221–240.

In later refinements of the theory of employment, these relations between intended and actual saving and investment were worked out by means of dynamic sequences in which lags were assumed in the circular flow of income. Although most of these sequences led to a discrepancy between intended saving and actual saving, a few of them dealt, on the other side of the equation, with the relation between intended investment and actual investment. In general, the dynamic models were so highly simplified that they could not be regarded as complete theories of economic fluctuations. There can be little doubt, however, that the lags in the circular flow of income which were incorporated in these simple models will be basic features of more complicated and realistic business cycle theories of the future. An understanding of these lags, and of their relation to dynamic theories of income, is therefore a useful preliminary to the study of business cycles. This is the purpose of the present paper. In the two sections which follow, a brief account is given of the principal lags in the circular flow, and of the way in which these lags have been used in dynamic theory. Finally, in IV below, statistical evidence is presented concerning the relative lengths of the principal lags.

II. POSITION OF THE LAGS IN THE CIRCULAR FLOW

The flow of income from business units to households, in the form of income payments to the factors of production, and back again to business units, in the form of purchases of goods and services, is a highly complicated process. If we examine the process in detail, we shall find that it consists not of one or two income circuits, as sometimes assumed, but of a very large number. Each circuit has distinctive characteristics of its own, particularly with respect to the length of time which is required to complete the flow. In the purchase of certain services by households, for example, the income spent returns almost immediately to other households in the form of income earned in rendering such services. When income is used to buy highly fabricated goods such as automobiles, on the other hand, a considerable period of time may elapse before the sales of the automobile dealers become an equivalent amount of income for factors of production. To complete the circular flow in this latter case, the proceeds of the dealers' sales must pass through the hands of a large number of different business units. The dealers who find their sales increasing must increase their orders from automobile manufacturers, and the manufacturers, in turn, must increase their rate of output. In adding to their output, the manufacturers will of course increase their orders from other business units, such as steel mills. Thus the increase in retail sales is gradually translated into an increase in income payments to households through many different stages of the production process.[3]

In order to trace out this flow of income in detail, we should need a new *Tableau Economique*, such as the one developed by Professor Leontief, showing how each industry's purchases from every other industry, and from households or factors of production, are related to that particular industry's level of output.[4] Dynamic studies of income and employment in the future will doubtless take the form of an elaboration and refinement of the Leontief tables. Only in this way can we expect to get a completely accurate picture of the flow of income and other money payments between factors of production and business units. At the present time, however, neither our statistical materials nor our economic theory are adequate for using the Leontief tables in business cycle studies. Leontief's technique, like that of Keynes in *The General Theory*, is essentially a static technique. While considerable progress has been made in incorporating Keynes' theory of employment into business cycle theory, the same cannot be said, as yet, of Leontief's system. It seems likely, therefore, that for some time we shall have to be content with business cycle theories which are considerably more crude and unrefined than those which will eventually be possible by elaborating Leontief's technique.

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[3] Cf. F. Machlup, *International Trade and the National Income Multiplier*, Phila., 1943, p. 1.

[4] W. W. Leontief, *The Structure of American Economy*, Cambridge, Mass., 1941, *passim.*, but especially Chapter 2. In this early version of his theory, Professor Leontief assumed that the demand for investment goods, as well as the demand for goods-in-process, depends upon the rate of current output in each industry. In later versions, the household equation was deleted, and both household expenditures and investment expenditures were regarded as autonomous. See, e.g., W. W. Leontief, "Output, Employment, Consumption and Investment," *Quarterly Journal of Economics*, Vol. 58, February, 1944, pp. 290–314.

This means, in particular, that for dynamic studies of fluctuations in income and employment it may be necessary to treat all business units as a group, and not to concern ourselves too much with inter-firm or inter-industry purchases and sales. Although this is admittedly a drastic simplification, I believe it is justified by the fact that it enables us to concentrate our attention upon certain causes of economic fluctuations which would tend to be obscured in a more elaborate economic model. If the economy is envisaged in this simplified manner as a combination of households or factors of production, on the one hand, with business firms or productive units, on the other, the circular flow may be regarded, at least to a first approximation, as a simple flow of income payments—wages, salaries, rents, dividends, etc.—from business units to households and as a reverse flow of consumption expenditures and security purchases from households to business units.

When a change occurs in the flow of income or in consumption expenditures there are at least three points at which the transmission of this change to the rest of the economy may be temporarily stopped. Suppose, for example, that the initial change takes the form of additional income payments to the factors of production. When households receive such additional income they will eventually increase their consumption expenditures. They may not do so immediately, however, and if not, the increase in the circular flow will be temporarily brought to a halt. This lag in consumers' expenditures behind income payments will be called a "household expenditure lag," or a "consumption lag." The principal explanation of the expenditure lag is to be found in the inertia of the average consumer. Consumers' expenditures are governed, to some extent at least, by habits or by customary standards of living, and these habits and customs are frequently difficult to alter. When income available for expenditure increases or decreases, a period of time may therefore elapse before a corresponding increase or decrease occurs in outlays for consumers' goods. In the meantime, the ratio of savings to income will have been temporarily changed.

The second important lag in the circular flow is the lag of output behind a change in the volume of sales. When the increase in income payments, in the example above, has been reflected in a greater demand for consumers' goods, there may still be no immediate increase in the level of production. A wholesale or retail dealer who finds his sales increasing does not immediately increase his orders by a corresponding amount. Instead, he usually waits for a while in order to be sure that the increase in demand is permanent. In the meantime, the discrepancy between sales and receipt of goods from manufacturers is offset by a decline in retail or wholesale inventories. Inertia on the part of retailers and wholesalers thus accounts for part of the lag in output behind a change in sales, but it is by no means the most important factor. Much more important is the fact that the production process itself requires time. Most manufactured goods are produced according to production schedules, and these schedules are not altered except in response to a large and sustained movement in the volume of orders from dealers. Thus, even after an increase in retail sales has been reflected in orders to manufacturers, a considerable period of time may still elapse before output is correspondingly increased. This lag in production behind sales will be called simply an "output lag."

When output is finally increased, income payments to the factors of production will normally increase as well. Wages, salaries, and other payments for services of the factors will increase as employment rises. In the case of at least one type of payment, however, there may be a considerable interval between the earning of income in the process of production and its distribution. Specifically, when business units earn higher profits as a result of expanded demand and production, they may not immediately adjust their dividend payments. This is the third important lag in the circular flow of income, and it will be referred to hereafter as an "earnings lag."

Starting with an assumed increase in income payments to the factors of production, we have considered three points in the circular flow at which the transmission of the increased money payments may be temporarily stopped or retarded. First, consumption expenditures may not respond immediately to the increase in income payments. Second, after consumption has increased, output may not be increased to meet the increase in sales; for a time, in other words, the increased level of consumption may be met from existing business inventories. Third, when output is increased there may be a lag in the distribution of part of the income earned in production. This happens when dividend payments lag behind corporate profits. The different ways in which these lags have been incorporated into theories of income and business cycles are discussed in the section which follows.

III. THE USE OF LAGS IN DYNAMIC ECONOMICS

In the development of dynamic sequences which show how income moves from one level of equilibrium to another, or how equilibrium in the circular flow is restored after a temporary disturbance, both the expenditure lag and the output lag have been widely employed. The expenditure lag is usually associated with the work of Professor D. H. Robertson, who introduced the concept of a consumption "day." Robertson defined his "day" in such a way that consumption expenditures of any given day depend upon the amount of income received in the preceding day.[5] In other words, he assumed a lag of one day in the expenditure of income behind its receipt.

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[5] D. H. Robertson, *Banking Policy and the Price Level,* p. 59.

After the publication of *The General Theory*, the Robertson sequence was frequently used to depict the multiplier as the limit of a sequence of expenditures in successive income periods.[6] In these illustrative examples, the time interval was divided into consumption periods, and it was assumed that all consumers plan their expenditures for a given period on the basis of the income which they receive in the preceding period. In other words, a lag of one unit period was assumed in consumers' expenditures—compared with income receipts. The amount of net investment during a given expenditure period was assumed to depend upon independent influences, such as the rate of technological change, the nature of competition, etc. National income for a given period was then computed by adding consumption expenditures of that period to investment of the same period. Thus, it was implied that output of consumers' goods during a particular expenditure period is equal to sales of consumers' goods in the same period. No allowance was made, in other words, for a lag in output behind sales; if any such lag existed at all, it was either explicitly or implicitly assumed to be quite short relative to the length of the consumers' expenditure lag. The final assumption of the Robertson sequence was that income payments of a given expenditure period depend upon national income of the same period. This assumption is equivalent to stating that the lag in distribution of business profits is negligible, compared with the expenditure period.

Since the output lag is negligible in the Robertson sequence, there are no unintended increases or decreases of inventories to be taken into account. Intended investment within a particular expenditure period is thus equal to actual investment, and any discrepancy between intended saving and intended investment must be attributable to unintended components of saving.

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[6] A few examples may be cited: (1) D. H. Robertson, "Some Notes on Mr. Keynes' Theory of Employment," *Quarterly Journal of Economics*, Vol. 51, November, 1936, pp. 168–197; (2) F. Machlup, "Period Analysis and Multiplier Theory," *Quarterly Journal of Economics*, Vol. 54, November, 1939, pp. 1–27; (3) A. H. Hansen, *Fiscal Policy and Business Cycles*, New York, 1941, p. 273.

The second important lag in the circular flow of income—the lag in output behind a change in sales—was first used as the basis of a dynamic sequence by Mr. Erik Lundberg. Instead of dividing the time-interval into expenditure periods, as Robertson had done, Lundberg conceived of a series of production-planning periods.[7] He assumed that the level of output for any given planning period is determined at the beginning of the period and remains unchanged until the beginning of the next period. If sales differ from the planned level of output, the difference is assumed to be met by an appropriate adjustment of inventories. The planned level of output at the beginning of each planning period is assumed, in Lundberg's system, to be governed by the past level of sales, and by requirements for inventory purposes. If business inventories are below the level which producers regard as normal, for example, planned output will include not only an amount sufficient to cover expected sales, but also an additional amount calculated to bring stocks up to a normal level. If inventories are abnormally high, on the other hand, it is assumed in the Lundberg system that producers as a group will plan to produce less than they expect to sell. Consumers' expenditures during a given planning period are assumed to depend solely upon the level of income produced, and hence upon the amount of income payments, within the same planning period. Lundberg thus assumes that both the expenditure lag and the lag in the distribution of profits are short, relative to the length of the lag in output behind a change in sales.

With the Lundberg system, it may be shown that when the equilibrium of an economy is disturbed, income always approaches its new equilibrium in a series of oscillations. This sequence has been used, in fact, as the basis for a theory of inventory cycles.[8]

---

[7] E. Lundberg, *Studies in the Theory of Economic Expansion*, London, 1937, Chapter 9.

[8] L. A. Metzler, "The Nature and Stability of Inventory Cycles," *Review of Economic Statistics*, Vol. 23, August, 1941, pp. 113–129.

It is not my purpose here to discuss inventory cycles, however, but simply to indicate the relation of the Lundberg sequence to the saving-investment controversy.

Since consumers' expenditures within a given production-planning period are assumed to depend entirely upon income produced, and income payments, of the same period, it follows that if we are looking at the components of income for any past planning period, actual saving and intended saving must be the same. That is, the amount of earnings which households and business units save during a given planning period are the same, in the Lundberg sequence, as the amounts which they would save if the given level of output and income were maintained over a longer period. From this it follows that any difference between intended saving and intended investment in a given planning period must be attributable to unintended components of investment. These unintended changes of investment take the form of movements of business stocks, which occur when there are discrepancies between planned production and the level of consumers' expenditures.

From the foregoing description of the Robertson and Lundberg models, it is evident that the latter is the complete converse of the former. Lundberg assumes that the time-interval between receipt of income and its expenditure is short, relative to the interval between a change in sales and a change in output. Robertson, on the other hand, assumes that consumers' expenditure lags behind income, and that within a given expenditure period, output responds immediately to a change in sales. Both dynamic systems assume that the lag in the distribution of business profits is negligible. The difference between the two systems thus hinges entirely upon the length of the output lag relative to the expenditure lag.

It is obvious that neither the Robertson sequence nor the Lundberg sequence is sufficiently complex to provide anything like a complete explanation of fluctuations of income, even if the major factors in investment decisions are known. When income is rising or falling, unintended elements will normally be found in both saving and investment. Nevertheless, if one of the two major lags in the circular flow is large, relative to the other, the discrepancy between intended investment and intended saving in periods of fluctuating income may be attributable predominantly to one side or the other of the saving-investment equation. Statistical evidence concerning the size of these two lags, as well as evidence concerning the lag in the distribution of business profits, is presented in the section which follows.

IV. RELATIVE LENGTHS OF THE THREE LAGS

Although the lag in expenditures behind income payments has been widely employed in dynamic economics, few attempts have been made to determine its length empirically. This is largely attributable to the fact that most empirical expenditure studies have been divorced from dynamic economic theory. Empirical consumption functions have been investigated by one group of economists while the dynamic theory of income was being studied by another, and few attempts have been made at integration. Had economists tested their theories more carefully against statistics of income and expenditure, it seems doubtful that the expenditure lag would have survived for so long as a central feature of dynamic economics. Data for the United States, at any rate, indicate that the lag in consumption expenditure is probably insignificant, relative to the lag in output behind sales.

Most of the studies of the consumption function during the inter-war period have been based upon statistics of annual income and expenditures. These have shown that consumers' expenditures seem to depend, without a significant lag, upon income of the current year.[9] This, of course, does not constitute a decisive proof that the lag in expenditure is insignificant, for the empirical consumption functions were based upon annual data, and monthly or quarterly figures of income and expenditures might conceivably show a different result. Even with quarterly data, however, surprisingly little evidence of a consumption lag may be found. In Figure I, consumption, by quarters, is compared with income payments for the period 1929 to 1938. All figures are in terms of 1929 prices, and both series are corrected for seasonal variation. The chart shows that, within a given quarter, consumption seems to be dependent largely upon income of the same quarter. In other words; the lag in consumption behind income payments is considerably less than three months. In 1929, for example, the decline in consumption occurred at the same time that income payments declined. Likewise, in 1933 the turning point at the bottom of the depression occurred in the same quarter for both consumption and income payments. Except for the beginning of the 1937–38 depression, the turning point of consumption coincided with the turning point of income payments throughout the entire period 1929–1938. No persistent lag in consumption is evident in the quarterly data.

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[9] L. R. Klein, *A Macro-Economic System, U.S.A., 1921–1941* (mimeographed paper of the Cowles Commission for Research in Economics), pp. A2–A3; A. Smithies, "Forecasting Postwar Demand: I," *Econometrica*, Vol. 13, January, 1945, p. 4; J. L. Mosak, "Forecasting Postwar Demand: III," *Econometrica*, Vol. 13, January, 1945, p. 33.

The apparent absence of a consumption lag is shown, in a different way, in Figure II. The first part of the chart is a scatter diagram of quarterly consumption plotted against quarterly income payments, without lag. It represents the quarterly consumption function on the assumption that the lag in consumption is small, relative to a three-month period. In the second part of the chart, consumption during each quarter is plotted against income payments of the preceding quarter. This would be the quarterly consumption function if one assumed that expenditures for consumption lagged one quarter behind income payments. It is apparent from the chart, however, that such an assumption is inadmissible; a much better relation is obtained from the unlagged data than from the lagged data. From these figures it seems reasonable to conclude that if a lag in consumption exists, it is either short, relative to the quarterly interval, or it applies only to a small part of total consumption.

CONSUMPTION AND INCOME PAYMENTS, 1929-1938

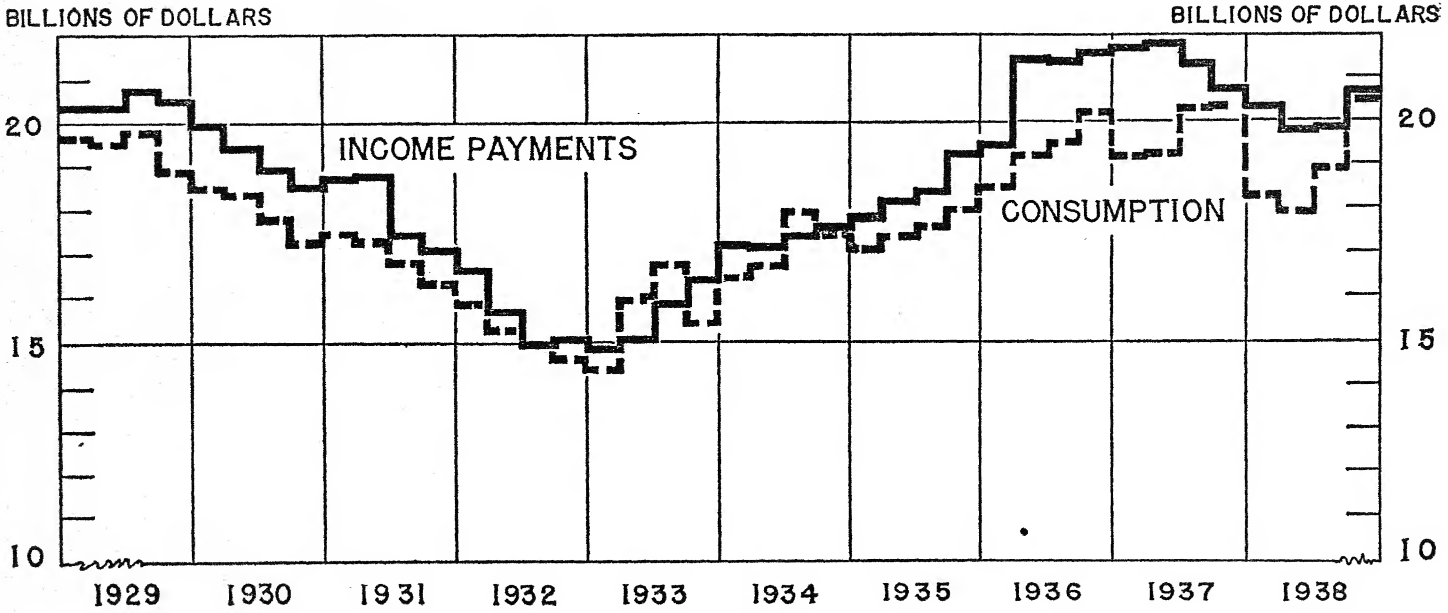

FIGURE I *

* Sources of data and methods of computation are given in the notes at the end of the chapter, p. 32.

THE RELATION BETWEEN CONSUMPTION AND INCOME PAYMENTS

(IN BILLIONS OF 1929 DOLLARS)

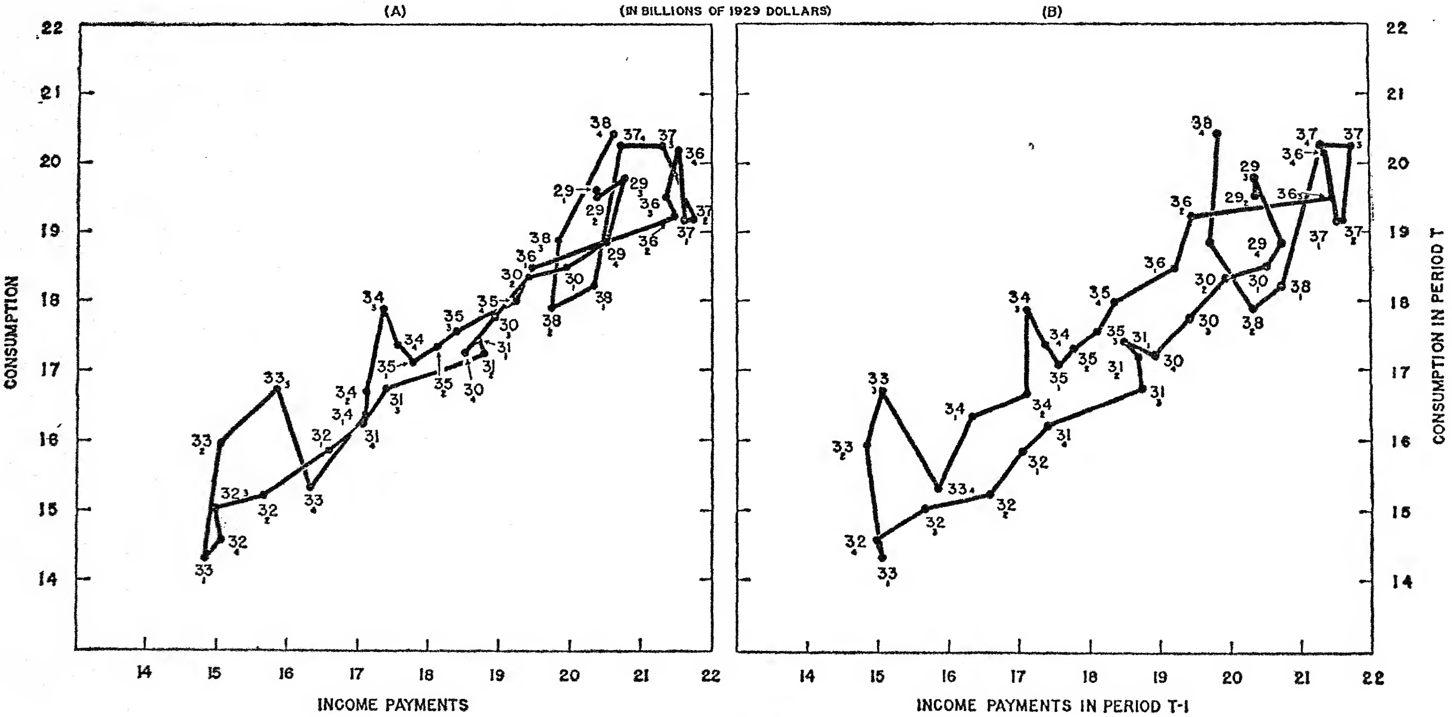

FIGURE II *

* Sources of data and methods of computation are given in the notes at the end of the chapter, p. 32.

Empirically, the size of the second type of lag—the lag in output behind a change in sales—is somewhat more difficult to determine. If such a lag exists, it should be observable in the movement of business stocks. Thus, at the top of the prosperity phase of a cycle, when sales begin to decline, one should expect that output, for a time, would exceed sales, and inventories would increase. A rise of business stocks after the close of a period of rising income is therefore *prima facie* evidence of a lag in output.[10] It is not conclusive evidence, however, for the increase in stocks may not be the result of business inertia but simply an *intended* increase for speculative or other reasons. No method exists for separating these intended changes in inventories from the changes which result from a temporary discrepancy between sales and output. Nevertheless, it is possible to find a number of examples, in the period 1921–1938, when it seems very improbable that a particular movement of inventories was an intended movement. In these cases, the best explanation of the inventory fluctuation is the presence of a lag in output behind sales.

Quarterly figures of net national product and of the total of manufacturers' and retailers' inventories are plotted in Figure III. Manufacturers' and retailers' inventories are here used to represent all business stocks, since comparable quarterly data for wholesale inventories are not available. The most striking example of a lag in output for the years shown in the chart is the period immediately following the downturn of 1929. Although national income began to fall in the fourth quarter of 1929, inventories continued to rise until the fourth quarter of 1930. While a small part of the rise in inventories may have been an intended increase for speculative purposes, it seems highly probable that most of the increase was a result of the failure of businessmen to adjust output to the sharp decline in sales. The year 1930 was a year of rapidly falling prices, and in this pessimistic atmosphere few business men could have been expected to increase their stocks in the hope of speculative gains. On the contrary, most of them would probably have been delighted to reduce their stocks below the 1929 level. Thus the statistics for 1929 and 1930 provide strong evidence of a substantial lag in output behind sales.

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[10] Similarly, a decline in business stocks, at the bottom of the depression, after income has begun to rise, is evidence that producers have not adjusted their plans to the rise of sales.

Less striking but none-the-less important indications of the output lag may be found in the decade of the twenties. The rise of income which began in 1921 was brought to a temporary halt in the middle of 1923. But despite the ensuing mild depression of late 1923 and 1924, business stocks continued to increase throughout most of the year 1924. Again it seems doubtful that the increase in stocks was an intended increase, for the period was one of generally falling prices when business expectations must have been pessimistic. Thus, between the second quarter of 1923 and the second quarter of 1924 the index of wholesale prices declined from 102 to 96.[11]

Other examples of the output lag may be found in Figure III, but the ones mentioned are sufficient to illustrate the significance of this lag.[12] It is apparent, from a comparison of Figure III with Figure I, that the output lag is more pronounced than the expenditure lag. The lag in consumers' expenditures behind income payments cannot be discerned in the quarterly data, whereas the lag in output behind sales is strongly indicated, if not decisively demonstrated, by quarterly statistics of net national product and inventories. Although wholesale inventory statistics, if available, might alter the results somewhat, it is doubtful whether they would completely change the picture presented in Figure III, for the changes in wholesale inventories are small, relative to the changes in all business inventories.[13] The combination of retail

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[11] U.S. Dept. of Labor, index of wholesale prices.

[12] The output lag is more pronounced in the period 1921–1930 than in the later years of the inter-war period. The absence of the lag in the decade of the thirties is probably attributable to speculation in business stocks. This matter, however, will be discussed more fully in a later paper.

[13] Annual figures for changes in wholesale, retail, and manufacturers' inventories may be derived from Harold Barger's *Outlay and Income in the United States, 1921–38*, New York, 1940, Table 34 of Appendix C. These figures show that, in the years when the movements of total inventories were substantial, the change of wholesale inventories constituted 10 to 25 per cent of the change in all business inventories.

RETAILERS' AND MANUFACTURERS' INVENTORIES
COMPARED WITH NET NATIONAL PRODUCT

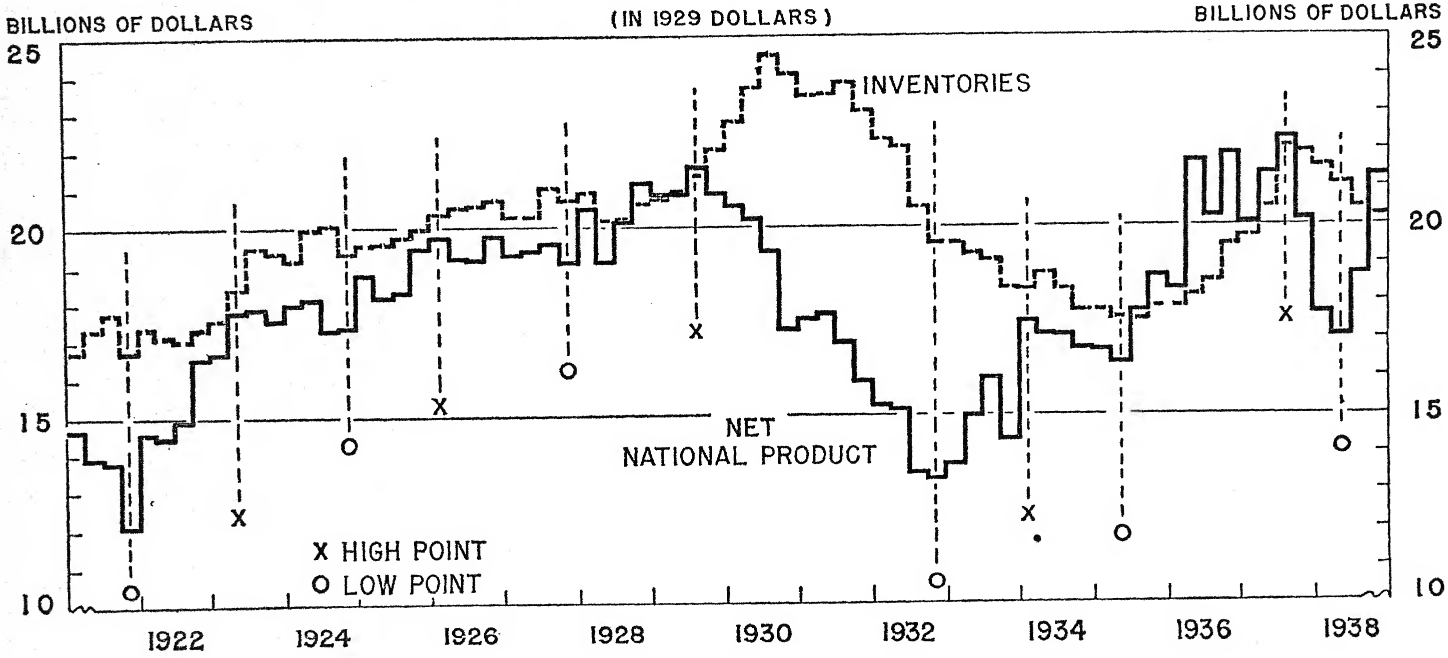

FIGURE III *

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* Sources of data and methods of computation are given in the notes at the end of the chapter, p. 32.

and manufacturers' inventories shown in Figure III comprises the predominant part of business stocks.

Empirical evidence concerning the third lag in the circular flow—the lag in the distribution of profits—is difficult to obtain, since several of the statistical series necessary for this purpose have not been published. Data for dividend payments, for example, are available only on an annual basis. Even more serious is the lack of information regarding the disposition of the profits of unincorporated business units; in the Department of Commerce statistics of non-corporate profits, no distinction is made between the total amount of such profits and the amounts withdrawn as personal income by entrepreneurs. With these gaps in our information, it is obviously impossible to determine, by direct means, whether the distribution of business profits lags behind their earning. It will be necessary, instead, to present partial information, and to infer, from other information, whether the lag is likely to be an important factor in the circular flow of income.

Consider first the relation between profits and the distribution of profits for the incorporated part of the economy. Corporate profits and dividend payments, on an annual basis, are presented in Figure IV for the years 1929–1938. Although the time-interval for these data (one year) is too long to reveal accurately the relation in which we are interested, the chart nevertheless contains some evidence of a lag in dividend payments behind corporate profits. At the bottom of the depression, for example, the low point of corporate profits occurred in 1932, whereas the low point of dividend payments occurred in 1933. Except for the bottom of the depression, however, the turning point of dividend payments appears to coincide with the turning point of profits, at least so far as these turning points are revealed by the annual data. This, of course, does not preclude the possibility that a lag may be present that is obscured in the annual data.

Much more significant than the suggestion of a lag is the picture which the chart presents of the stabilizing influence of dividend payments. Quite apart from the lag, the cyclical fluctuations of dividend payments are decidedly smaller than the fluctuations of corporate profits. This means that in periods of rising or falling income a part of the increase or decrease in the value of total output is not passed on in the form of income to households, but is permanently absorbed by the business units. Between 1929 and 1932, for example, corporate profits declined from 7.2 billion dollars to —3.6 billion dollars, a total decline of 10.8 billions. The decline of dividend payments, by contrast, was 3.7 billion dollars, or slightly more than one-third of the decline in profits. In the subsequent economic expansion of 1932–1937, the increase in corporate profits was approximately 7.6 billion dollars, compared with an increase of 2.6 billions in dividend payments.

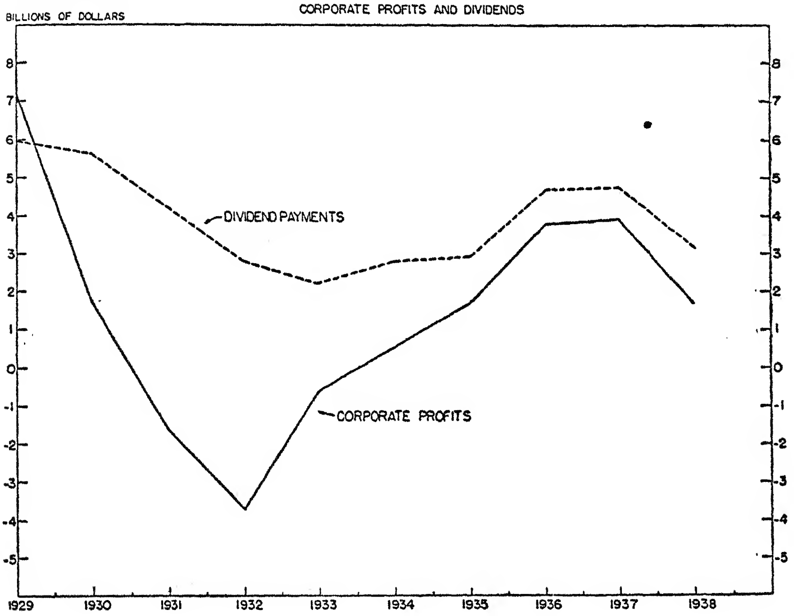

FIGURE IV *

* Sources of data are given in the notes at the end of the chapter, p. 32.

In view of the small amplitude of fluctuations in dividend payments, relative to fluctuations of corporate profits, the exact length of the lag in dividend payments is perhaps not a matter of great importance. Since a large part of the fluctuations in corporate profits are never reflected in income payments to households, slight changes in the timing of the relatively smaller fluctuations in dividend payments will probably not have an appreciable effect upon the circular flow of income. In other words, the propensity of corporations to save is a more important regulator of the circular flow of income than the lag in dividend payments. This means that the error from ignoring the lag in dividend payments will probably be small, and that for certain problems of business cycles, dividends, along with other income payments, may conveniently be regarded as depending upon the current level of output. Whether this is also true of the distribution of non-corporate profits can be determined only when additional data are available.

V. CONCLUSIONS

The principal conclusion to be drawn from the preceding discussion is that the lag in consumers' expenditures is short, relative to the lag in output. Although some evidence of a lag in dividend payments is apparent, in addition to the output lag, the influence of this earnings lag on the circular flow is reduced by the high propensity of business units to save. These results mean that if one examines the saving and investment components of national income during periods of fluctuating income and employment, the discrepancy between intended saving and intended investment will usually be found to be due largely to unintended changes in investment, rather than to unintended changes in saving. In other words, it seems probable that unforeseen or unexpected changes in business inventories are the principal factor which equalizes actual saving and actual investment in periods when the discrepancies between intended saving and intended investment are large.

If this conclusion is correct, a reconsideration of dynamic economic systems in which unintended saving plays a dominant part would seem to be in order. Such systems do not appear to be in accord with the facts of American economic life. While no simple dynamic system, such as the sequence of Professor Robertson or that of Mr. Lundberg, can ever be an accurate representation of the complex events which comprise business cycles, the statistics presented above suggest that the Lundberg sequence is probably more realistic, as a first approximation, than the sequence which depends upon a lag in consumption. In other words, the consumption "day," which played such a prominent part in early explanations of the multiplier, is not, from an empirical point of view, a particularly useful concept.

The fact that the household-expenditure lag is short, relative to the lag in output, is important from the point of view of business cycle theory, for it provides an empirical foundation for the theory of inventory cycles. With a circular flow mechanism such as that postulated by Lundberg, it is easily shown that disturbances in the level of income create a series of cycles of diminishing amplitude. These cycles are inherent in the structure of production and sales, and for this reason might be regarded, in the traditional way, as endogenous cycles. Although they depend upon an initial impulse or disturbance to get them started, they are self-propagating once they are started. In the years since the presentation of the theory of employment, there has been a tendency to neglect such self-propagating or internal cycles, and to assume, for the most part, that observed movements of income represent a sort of moving equilibrium defined by the propensity to consume and the amount of autonomous investment. With this conception, the important determinant of economic fluctuations is the movement of autonomous investment; fluctuations of income are simply an expanded reflection of the change in the basic investment series, or the marginal efficiency of capital.

Although it is no doubt true that changes of long-run investment account for the major fluctuations of economic activity, considerable evidence is accumulating to suggest that the shorter and less violent fluctuations may be internal or endogenous cycles. If so, the output lag discussed above assumes an increasing importance, for it is the basis of at least one theory of short-run fluctuations.

SOURCES AND METHODS OF COMPUTATION OF DATA

FIGURE I

(1) Consumption data from Harold Barger, *Outlay and Income in the United States, 1921–1938*, New York, 1940, Table 9, page 93. Barger's figures, in current prices, were deflated by the Bureau of Labor Statistics index of retail prices. Since the B.L.S. index has been compiled only semi-annually for some years, it was necessary to interpolate for these years. (See U.S. Dept. of Labor, *Changes in Cost of Living in Large Cities in the United States*, 1913–41, Bulletin No. 699, Washington, D.C., 1941.)

(2) Income payments data are U.S. Department of Commerce series for income payments, deflated by B.L.S. index of retail prices. The recent revisions which the Department of Commerce made in its statistics of national income were published too late to be included in this study, and the data of income payments are accordingly the unrevised estimates. (For revised data, see National Income Supplement to *Survey of Current Business*, July 1947.)

FIGURE II

Sources same as for Figure I.

FIGURE III

(1) Net national product figures were derived from Harold Barger, *op. cit.*, Table 11, pp. 114–119. Figures for net outlay (or product) in current prices were deflated by Kuznets' implicit price index interpolated from an annual to a quarterly basis.

(2) Inventory data were also derived from Barger, *op. cit.*, Appendix C. Retail inventories were obtained from his Table 34, page 325. Manufacturers' inventories for the period 1929–1938 were obtained directly from Table 33. For the period 1921–1928, the Barger figures for inventories of six manufacturing groups (Table 31) were adjusted upward to agree with the Kuznets' year-end statistics by straight-line interpolations. (See S. Kuznets, *Commodity Flow and Capital Formation*, Tables VII–VIII.) The figures were then adjusted for seasonal variation by the link-relative method.

FIGURE IV

Source, U.S. Dept. of Commerce national income statistics, reprinted in *Federal Reserve Bulletin.* As in Figure I, the statistics used in this figure are the unrevised data.

II

Investment, Losses, and Monopolies

BY

EVSEY D. DOMAR

THE MAINTENANCE of full employment requires a steady flow of new investment. As a matter of fact, there are good reasons to believe that a constant level of investment, however high, will not suffice; as our productive capacity expands as a result of growth of population, technological progress, and accumulation of capital, unemployment will develop unless income grows as capacity expands. And if the propensity to save does not fall—and, barring drastic government interference, we have no reasons as yet to expect such a fall—an ever increasing stream of investment will be needed as well.[1]

Where can this stream of investment be expected to come from? This question forms the subject matter of the present paper. Before we begin looking for an answer, two qualifications should be made. The first is that we have here in mind a private capitalist economy in which government plays a rather subordinate part. We are really interested in the sources of private investment undertaken by business firms without direct stimuli from the government. Secondly, we shall speak about net investment, *i.e.*, investment over and above depreciation. Even though such an approach lacks precision due to the difficulty of defining depreciation, it will nevertheless be more useful in bringing out the essential points of the argument.[2]

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[1] The problem of growth is discussed in my paper, "Expansion and Employment," *American Economic Review*, Vol. XXXVII (March, 1947), pp. 34–55.

The paper consists of five sections. Sections I and II deal with *spontaneous investment*, *i.e.*, investment which does not basically depend on a rise in national income. This investment is contrasted with another type which is directly *induced* by rising income. This type is taken up in Section III. Section IV contains some suggestions regarding the effects of monopolies (in a broad sense) on investment, and Section V presents the concluding remarks.

I. SPONTANEOUS INVESTMENT—TECHNOLOGICAL PROGRESS AND DISCOVERY OF NEW RESOURCES

Hardly any present-day economist will dismiss the problem of investment outlets by saying that an appropriate reduction of the interest rate will automatically provide all the investment we need. Recent studies, both theoretical and empirical, have shown that, with the exception of very long term investments (such as buildings), variations in interest rates do not play a significant role.[3] If we envisage what may be called a typical firm in our capitalist economy, we shall find that after it has adjusted itself to the demand for its products and to the costs of labor and raw materials, and built an optimum-sized plant, it has no reason to invest any more, over and above depreciation. An economy in which all firms are in this position of equilibrium is an economy of zero net investment. If this happens in our society, we may expect to have an unprecedented amount of unemployment.

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[2] In a few places, an attempt to define depreciation might be of some help. We shall mean by it the cost of replacement of a depreciated asset by another one of equal productive capacity. The purpose of this definition, which is about as bad or as good as any other one, is to emphasize the connection between net investment and an increase in capacity.

[3] See, for instance, P. W. S. Andrews, "A Further Inquiry into the Effects of Rates of Interest," *Oxford Economic Papers*, No. 3 (Feb. 1940), pp. 32–73; and G. L. S. Shackle, "Interest-Rates and the Pace of Investment," *The Economic Journal*, Vol. LVI (March 1946), pp. 1–17. Also, see the paper by Richard A. Musgrave, p. 220, in this volume.

From this it follows that net investment will not be forthcoming unless certain *changes* take place. Following Professor Hansen, we may distinguish two sets of these changes:[4] (1) *spontaneous* changes, such as technological progress, discovery of new resources, aggressive competition, etc., which do not essentially depend on a preceding rise in national income; (2) *induced* changes directly caused by a preceding rise in income.

The number and variety of spontaneous changes which may give rise to investment is undoubtedly very great. We shall concentrate on a few important classes. The role and importance of technological progress, discovery of new resources, and population growth have been analyzed at some length by Professor Hansen, and there is no need to go over his work here. I would like to emphasize that these developments should be interpreted not in the "must" but in the "may" sense: a new product or a new resource *may* give rise to investment. Some such disturbance is a *necessary* condition for creating an investment outlet, but it is by no means a *sufficient* condition.

Technological progress can affect a given firm in three ways: (1) by offering a new method of production, (2) by creating a new product, and (3) by increasing the demand for its products or supply of raw materials as a result of a primary technological change that has occurred in another firm or industry. We shall consider these three possibilities in turn.

(1) The new production method may require a mere readjustment of existing plant and equipment with a very small amount of new investment. In such a case, its primary effects, as a creator of investment opportunity, are nil, but the drop in costs, if followed by a reduction in prices, will lead to greater output which may require new investment. Much will of course depend on the intensity of competition in the industry concerned and on the elasticity of demand for its product.

A more typical case arises when the change in the method of production takes the form of a new and superior instrument of production, such as a machine. But its superior qualities do not at all guarantee that it will be immediately installed. Against the profit which this new machine can be expected to bring, our firm has to weigh the loss from scrapping its existing equipment. Just when the installation of the new machine will be found worthwhile is a rather complex problem.[5] A few remarks will have to suffice here.

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[4] See his *Fiscal Policy and the Business Cycle* (New York, 1941), Part Three, and particularly pp. 287 and 297.

Very much will depend on the structure of the industry and on the position of the firm in the industry. If the industry is characterized by intense (though by no means pure) competition, and other firms have already adopted the new machine or are likely to do so in the near future and thus possibly outsell our firm, then the loss sustained from scrapping its existing equipment becomes an accomplished fact. It is written off, and from then on our firm behaves as if it never owned the scrapped plant, as if it were a new firm just entering the industry.

The size of the firm's output relative to that of its industry is also of major importance. If our firm commands a small part of the total market (for products of that type), then the introduction of the new machine may become particularly attractive as an instrument for underselling other firms and capturing their markets. Then the loss sustained from scrapping the old plant will appear negligible in comparison with profits expected from such a conquest. A new firm would have a whole world to conquer. On the other hand, if our firm already possesses a sizeable part, if not all, of the market, then there isn't much to conquer, and the loss from scrapping bulks large.

It is perfectly natural for each firm to try to minimize losses from scrapping, and therefore to postpone the acquisition of new machinery until the existing machinery has considerably depreciated. But if all firms act in this manner, the results for the economy as a whole may be very sad, since investment financed merely from depreciation reserves is not *net* investment.[6] Thus to the extent that firms succeed in avoiding scrapping losses and in utilizing depreciation reserves to improve their methods of production, an important outlet for investment dries up. Technological progress does not result then in new investment. And as we have seen above, the less competitive an industry is, the more likely is this development to take place.

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[5] Professor Kuznets shows that the greater the expected demand for the firm's product, the sooner will it pay it to replace old machinery by new. See his very interesting article, "Relation Between Capital Goods and Finished Products in the Business Cycle," in *Economic Essays in Honor of Wesley Clair Mitchell* (New York, 1935), pp. 209–267.

(2) Technological progress which takes the form of a new product or a substantial improvement of an existing one (the difference being merely that of degree) raises exactly the same problems. As in the preceding case, the new product may not require any new investment. If it does require new investment, the firm's attitude to it will depend to a great extent on whether or not the new product can be used as a close substitute for another one put out by the firm. If the new product is such a substitute, then the firm has to face the unpleasant fact that it is likely to eliminate the market for the old one, and thus lead to capital losses from scrapping, just as in the preceding case. Again the structure of industry and the size of the firm's market relative to the total are of importance. In a highly competitive industry, postponement of the change to the new product (until equipment producing the old one is considerably depreciated) may be dangerous, because other firms may make an earlier start and capture our firm's market.[7] Also, if our firm has commanded a small part of the total market, the loss from eliminating itself will appear small as compared with the possible gains from new conquests. And again we observe the strategic position of the new firm which has no interest in preserving the old product and whose actions are not inhibited by possible capital losses.

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[6] This is true in a broad sense. The precise meaning of the statement depends on the definition of depreciation.

[7] This presupposes that the new product is not patented. But even if it is, there is the danger that a close substitute not requiring the given patent may come out on the market.

(3) Not much need be said about the third effect of technological progress, namely the investment made by a given firm in response to a technological development in another firm or industry. Thus aluminum expands because of technological progress and expansion of aircraft. This kind of investment has undoubtedly been very important. For instance, the expansion of the rubber, glass, and steel industries has been greatly stimulated by the invention and growth of the automobile.[8] If the existence of monopolies retards this kind of investment, it is only because they may charge higher prices, a situation by no means desirable, but certainly not as bad as that discussed in the preceding two cases.[9]

Before summarizing our findings regarding technological progres, let us turn to the importance of new resources as a source of investment opportunities. The parallel with technological progress is so complete that little need be added to our previous discussion. The discovery and exploitation of new resources either reduces costs of output and thus acts as a new method of production, or it creates a new product. Both effects, which often go together, may create conditions favorable for new investment. But here again we run into the problem of losses. The new resource, whether it be new farm land, or a new deposit of copper, or a new stand of timber, cannot help but compete with the products of existing resources, the owners of which will react in exactly the same manner as they did to technological progress; that is, the nearer they are to a monopolistic control, the less they will be interested in the *immediate* utilization of the new resource, and the greater will be their opposition to any newcomers. It was very fortunate for this country that, throughout the nineteenth century, a farmer wanting to take up land, say in Iowa, did not have to obtain permission from a New England legislature, who would have undoubtedly refused to grant such a permission whenever, in its opinion, the development of Iowa farms depreciated farm land values in New England, as in fact it did. Or would Japan have been industrialized as rapidly as it was if it had been a British colony? It can hardly be said that the British government of India encouraged the development of local industries which might compete with those of Great Britain herself.

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[8] See Hansen, *op. cit.*, pp. 38, 41.

[9] I say "may charge higher prices" because it cannot be proved that prices are higher under monopolistic as compared with competitive conditions, since the firms concerned have entirely different cost curves.

Thus the effect of technological progress and of the discovery of new resources on investment depends to a considerable extent on our institutional framework, or more exactly on the intensity of competition. This is not to say that a monopolistically organized industry is necessarily inimical to innovations—witness the vast research laboratories maintained by many big corporations. It is the ability of monopolies to protect themselves from capital losses that is injurious to the economy. They try to postpone investment until existing equipment is sufficiently depreciated, and thus new technical devices are financed from depreciation reserves, therefore failing to create investment opportunities for outside savings.[10] The capital loss which they try to avoid is, however, only a potential loss; if new investment comes in large quantities, national income will rise and there may be enough room for everyone. Then the expected capital loss will fail to materialize. But to an individual firm's mind the loss appears decidedly more imminent than the hoped-for-rise in income. Under the unstable conditions of a capitalist economy, no other reasoning can be expected. We shall return to this question in Section IV.

II. SPONTANEOUS INVESTMENT—COMPETITION, POPULATION GROWTH, AND A FEW OTHERS

In the preceding section we have established that whether or not new investment opportunities will arise as a result of technological progress and the discovery of new resources depends to a considerable extent on the intensity of competition in the industry concerned. This intensity, or perhaps we should say, aggressiveness, of competition is so essential a factor affecting investment that we may classify it, even at the expense of logical consistency, as a separate source of spontaneous investment. Its importance is by no means limited by the two cases we have discussed. Aggressive competition makes firms lower their prices to capture new markets (at the expense of other firms), and this may lead to additional investment by the expanding firm. It also makes unused capacity, so frequent in a capitalist economy, less of a threat to new investment; the fact that some firms are not operating at capacity does not prevent others from going ahead and expanding, often at the expense of other firms, who may therefore suffer a loss. Indeed, losses inflicted by one firm on another form the very essence of competition, though, as was argued above, this loss is of a potential nature and may be eliminated by a sufficient rise in national income. But if all firms, by force or agreement, are able to protect themselves from this potential loss, aggressive competition becomes impossible.

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[10] I do not claim any originality for these conclusions. They have been stated a number of times. See, for instance, Hansen, *op cit.*, pp. 363–364, and Paul M. Sweezy, *The Theory of Capitalist Development* (New York, 1942), pp. 276–277.

Of the various forms of this competition, one deserves particular attention—the emergence of a new firm. For our purpose, the most essential characteristic of a new firm is not its legal newness, but the fact that it has no investment as yet in a given field. If an existing firm opens up another department to enter a new field, that department is also "new" from our point of view. Not having any investment of a given type, the new firm is of course free from excess capacity; it therefore can go ahead without waiting until its excess capacity is eliminated by a rise in demand or by depreciation. We have noted above that the new firm is more willing to adopt new technical devices or to exploit a new resource, because by its very nature it has no capital equipment, and therefore cannot suffer a loss from scrapping it. The gains it expects from a given venture are *net* gains; the possible losses are suffered by other businesses, and thus need not inhibit the new firm. All this holds true regarding any venture, not necessarily associated with technological or other change; but the possession of a new technical device or the discovery of a new resource provides the new firm with a weapon to break through and to get established.[11] In general, the odds are heavily weighted against a newcomer.

There is little doubt that the emergence and development of new firms, new combinations of management, labor, and capital, are extremely essential not only for investment, but also for the very process of industrial progress in a capitalist society, just as the sprouting and growth of new trees are vital for the healthy growth of a forest; old, well-established units sooner or later become stale and degenerate. But very little is done by our society to help the new firm, and some of our tax laws definitely discriminate against it.[12]

Before finishing our discussion of spontaneous investment, a few words should be said about the role of population growth, speculation, and various sporadic changes. The growth of population affects investment outlets not only by increasing the number of consumers, but also by providing a larger labor force. In such fields as housing and public utilities population growth undoubtedly calls forth additional investment. The argument so often advanced that what matters is the total purchasing power rather than the number of persons possessing it, omits the fact that if a new family needs a place to live it may build a house by taking out a mortgage. Similarly, public utilities take it for granted that new families will use gas and electricity, and they may, therefore, expand their plants in *advance* of increasing demand.

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[11] It should be recognized here that a monopoly on the new device (i.e., patent) may be necessary to enable the new firm (or, in general, any small firm) to make the start. Otherwise it may be easily tramped down by existing giants. This point is made by Professor Schumpeter in his *Capitalism, Socialism, and Democracy* (New York, 1942), pp. 88–92. We should distinguish, however, between such temporary monopolies which are needed for investment and the more general monopolistic practices which stifle expansion.

[12] I am referring to the loss carry-back and carry-forward provisions of our corporation income taxes which allow existing corporations to share their losses with the Treasury, while the newcomer, having no past income for a carry-back and often no future income (if it does not survive its loss) for a carry-forward, has to bear the whole burden of the loss. For a more thorough discussion of this problem see E. D. Domar and R. A. Musgrave, "Proportional Income Taxation and Risk Taking," *Quarterly Journal of Economics,* Vol. LVIII (May, 1944), pp. 388–422. Also see the paper by C. Brown, p. 300, in this volume.

The growth of the labor force has a dual effect on investment. On the one hand, it prevents an over-accumulation of capital in the sense of capital becoming too abundant relative to labor. To the individual firm this takes the form of a slower rise in wages than would otherwise be the case. As a result, the firm may expect a higher yield from its investment, and therefore invest more. But on the other hand, lower wages discourage the introduction of labor-saving devices, which form an important element of total investment. A proper analysis of these conflicting tendencies cannot be undertaken in a few paragraphs. My own feeling is that the growth of the labor force encourages rather than discourages investment.[13] What would the capital wealth of this country be today if our population had been frozen at the 1800 level of some five millions? And yet, on the other hand, a 35-million population increase in India (between 1931 and 1941) has had hardly any favorable effects on investment opportunities in that country. In any event, whatever the effects of population growth on investment have been in the United States, this growth itself is largely a thing of the past. Much investment from this source can hardly be expected in the future.

When an economy has experienced a rapid rate of growth over a period of years, such growth may begin to be taken for granted. Under these conditions, investment may be undertaken, not in response to a specific technical device or a new resource, but simply in anticipation of a rising demand, even though the latter has not actually occurred.[14] Investment of this type is essentially speculative although an element of speculation is of course present in investment of any kind. In the nineteenth century and perhaps in the first quarter of the twentieth, investment in anticipation of rising demand played an important role; many of our railroads were built well ahead of demand for traffic. Under present conditions, however, it would be hard to convince businessmen (in the absence of a positive guarantee from the government) that they should make substantial investments in anticipation of a rising demand. They will prefer to wait and see what happens. There may be other reasons for speculative investment, such as expectations of rising prices, but, while they may be of importance during a recovery, we should not expect too much from these sources over a longer period of time.

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[13] It should be pointed out that we are concerned here only with the problem of whether a larger labor force leads to more investment *in the absolute sense*. Our discussion does not imply that so much more investment will be undertaken as to reduce unemployment below where it would be without the growth in the labor force. That is a separate problem not touched upon here.

[14] This property distinguishes this kind of investment from the *induced* type (discussed in Section III), brought about by an *actual* rise in national income.

Finally, our economy is subject to all sorts of sporadic changes, such as new tastes and habits, movements (not growth) of population, and so on, which may give rise to investment. We should, however, be careful not to engage in double counting, since significant changes in tastes and habits are due, to a great extent, to technological progress. We might have discussed another very important investment outlet—net export balance—but the latter really belongs to the realm of international trade, and in the present state of world affairs is not likely to achieve considerable magnitude without active government interference. Since the present paper deals only with private investment, it would be inappropriate to discuss a government-financed export surplus.

The common characteristic of all the types of investment discussed so far is their *spontaneity*, in the sense that they do not basically depend on a current rise in national income. Income may remain constant or even fall, and still some spontaneous investment will take place. Similarly, the presence of unused capacity is not a great obstacle to investment of these types. On the other hand, spontaneous investment cannot be treated as a random variable. It does not take place in a vacuum, but is affected, like other business decisions, by general economic conditions. New products or new machines may appear very promising by themselves, and yet in a year like 1932 their introduction may well be postponed. Moreover, many buildings and machines can be adapted for new uses; and so, when excess capacity is particularly large, a new firm may simply purchase an existing plant which stood idle, instead of building a new one. Even with these qualifications, however, it remains true that neither a constant national income nor the presence of excess capacity will necessarily deter spontaneous investment. This characteristic of spontaneous investment is its greatest virtue for a capitalist economy, where a rise in income cannot be taken for granted, and where the presence of excess capacity is almost a chronic condition. This characteristic also makes spontaneous investment very difficult to predict, or to express, in general, as a function of the magnitude or the rate of change of gross national product, or profits, or some other aggregate series.

As far as future prospects are concerned, our main sources of private spontaneous investment will probably come from technological changes and aggressiveness of competition, with the size of one, net export balance, remaining in doubt. As motives for investment, technological changes and aggressive competition overlap and support each other. Without competition, technological progress may take the form of a different utilization of depreciation reserves, rather than of new investment. Similarly, without a new technical device, a new (or an existing) firm may lack a weapon to wage the competitive struggle. Thus, technology and competition reinforce each other.

III. INDUCED INVESTMENT

By induced investment we mean that undertaken directly in response to an increase in demand caused by a rise in national income.[15] So long as income remains on the same level, however high, induced investment does not take place. It is only when income *rises* that opportunities for investment of this kind may appear.[16]

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[15] The reader will see that the distinction between spontaneous and induced investment, and also among the various kinds of spontaneous investment, is analytical rather than real. An investment is usually made for several reasons, and an empirical classification would be very difficult, if not impossible, to make.

[16] Induced investment is made here to depend on a rise in *income* rather than in consumption. The latter approach, commonly used in economic literature,

The notion of induced investment has appeared in economic literature many times, particularly in connection with the acceleration principle. J. M. Clark used it quite early as a partial explanation of the greater relative fluctuations in producers-goods industries, a matter of great importance in the analysis of the business cycle.[17] A whole theory of the business cycle has been built around the acceleration principle by Harrod,[18] and Samuelson's analysis of the interaction between the multiplier and the acceleration principle is of course well known.[19]

In a number of business cycle models, induced investment has been treated either as a direct function of an increment of national income, or it has been related to such an increment indirectly by bringing in profits, changes in capital stock, etc., with all sorts of lags.[20] An interesting model of the cycle, based on Samuelson's work, has been constructed by Hubbard, by transforming Samuelson's constants into numbers of varying magnitudes.[21] And finally, the whole idea of pump-priming, so popular in the 'thirties, was essentially based on the acceleration principle and induced investment.

Despite its popularity, the approach to the problem of business cycles based upon the acceleration principle has always been under attack. Some fifteen years ago, Ragnar Frisch proved that Clark had overstated his position, and that a slowing down of the rate of increase of consumption does not necessarily result in a

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appears to me incorrect, because a rise in demand for producers' goods may also call forth additional investment.

[17] See his "Business Acceleration and the Law of Demand," *Journal of Political Economy*, Vol. XXV (March, 1917), pp. 217–235; also *Strategic Factors in Business Cycles* (New York, 1935).

[18] R. F. Harrod, *The Trade Cycle* (Oxford, 1936).

[19] Paul A. Samuelson, "Interactions between the Multiplier Analysis and the Principle of Acceleration," *The Review of Economic Statistics*, Vol. XXI (May, 1939), pp. 75–78. Also reprinted in *Readings in Business Cycle Theory* (Philadelphia, 1944), pp. 261–269.

[20] See, for instance, Michal Kalecki, *Essays in the Theory of Economic Fluctuations* (New York, 1939), particularly pp. 116–149; also Stanley Lebergott, "Forecasting the National Product," *American Economic Review*, Vol. XXXV (March, 1945), pp. 59–80.

[21] Joshua C. Hubbard, "A Model of the Forty-Month or Trade Cycle," *The Journal of Political Economy*, Vol. L (April, 1942), pp. 197–226.

fall in investment.[22] But the most important critical article on the subject that I have seen came from Professor Kuznets.[23] He showed that as soon as the acceleration principle is tested under realistic conditions, such as the presence of unused capacity, and a lag between the rise in income and the decisions of entrepreneurs to invest, the principle loses much of its charm and force. And, as will be shown below, even in the absence of these two factors, a rise in income does not necessarily call forth induced investment.

We shall approach the problem from two points of view: first, in terms of aggregate demand, and second, in terms of demand for specific products.

From the aggregate point of view, the issue is fairly clear and not much need be said about it. So long as unused capacity exists, a rise in income cannot be expected to give rise to induced investment. It is only after full capacity has been reached that further increments in income may have such an effect. It is not necessary, however, to be dogmatic here. Productive capacity, or its unused portion, is not a clear-cut concept which can be easily expressed by a single number. Also, unused capacity is usually a very spotty phenomenon. It is by no means uniformly distributed among firms and industries. Induced investment may therefore appear long before full capacity is reached, but the exact impact of a rise in income on investment will depend to a great extent on the character of this rise, that is, on the kinds of products demanded, as related to the distribution of unused capacity among firms and industries. Clearly, however, the examination of aggregate figures alone, which can at best show only the over-all or average unused capacity, is of little help. Depending on the distribution of unused capacity, a given rise in income will have entirely different effects on investment.

Even if unused capacity is absent originally, a mere rise in national income does not automatically create opportunities for induced investment. As income rises, so does investment (barring drastic reductions in the propensity to save); therefore productive capacity increases as well. The need for additional investment will appear only if income increases faster than capacity. But how fast can capacity be expected to increase? Let the marginal propensity to save be equal to, say, 12–15 per cent. If full employment is to be maintained, this fraction of the increment of income must be invested. Now, it is not unreasonable to assume that the average dollar invested increases annual (net) productive capacity by some 25–33 cents. Thus the maintenance of full employment will assure a growth of productive capacity at a rate equal to 12–15 per cent times 25–33 per cent, or by some 4 per cent per year.[24] We can therefore conclude that opportunities for induced investment (on the aggregate level) can be expected to appear only if income increases faster than at this rate of 4 per cent.

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[22] See the controversy between Frisch and Clark in the *Journal of Political Economy*, Vol. XXXIX, (1931), pp. 646–654, 814–816, and Vol. XV (1932), pp. 253–255, 691–693, 694.

[23] Kuznets, *op. cit.* J. Tinbergen in his study also came to rather pessimistic conclusions. See his "Statistical Evidence on the Acceleration Principle," *Economica*, new series, Vol. V (May, 1938), pp. 164–176.

At the beginning of the upswing, it can and usually does happen that income increases at a rather rapid rate so that opportunities for induced investment may appear. The only trouble is that the beginning of the upswing is also characterized by substantial excess capacity, which makes induced investment less probable. On the other hand, excess capacity gradually disappears in the upper stage of the upswing; but then, of course, income cannot grow too fast without creating an inflation. It thus appears that over a period of time, attempts to foster induced investment by having income outrun productive capacity may very well keep us uncomfortably close to inflationary price rises. We should not forget that in the absence of some central planning and an assurance that income will actually continue to rise, firms will not expand as soon as demand rises. They will rather wait and see whether the rise in demand is temporary or not, and meanwhile respond by overtime work and—very probably—price increases. If the rise in income can, with reasonable precision, be foretold in advance, this

[24] The figures in the text, though not unreasonable, are presented as illustrations. The whole problem of growth is discussed at a greater length in my paper, *loc. cit.*

need not be the case; but such a situation is not likely in a free capitalist society.

An attempt can be made to sidetrack the problem of the effects of investment on capacity by assuming—and quite realistically for that matter—that the increase in capacity appears with a substantial lag, while income is generated at once or with a short lag. Thus while the major part of the multiplier effect works itself out in a few months, the increase in productive capacity may be delayed by a year or two or even more.[25] But too much should not be made out of this lag. Even though investments currently made may not enlarge productive capacity, those made previously do. And against this lag in the increase in productive capacity we should also weigh the counteracting fact that firms do not expand at the slightest increase in income. They wait and test the permanency of this increase. And by the time they are ready to act, the increase in capacity brought about by new investments is much nearer at hand.

All this on the aggregate level. If we take a step down and look at individual firms and industries, new possibilities for induced investment may appear. Suppose that both productive capacity and national income increase at the required rate, such as the 4 per cent mentioned previously. This rate, however, is the *average* relating to the whole economy. It is possible, or even likely, that the demand for products of some particular firms or industries expands faster than their capacity, thus calling forth additional investment of the induced type. But we should remember that if capacity in some parts of the economy lags behind the rise in demand, the capacity in other parts must necessarily outstrip demand, since on the average demand and capacity increase at the same rate. The owners of those firms and industries, the demand for whose products falls short of their capacities, will be disappointed and possibly suffer a potential loss. Thus induced investment in some fields takes place at the expense of potential losses in others. If no one is disappointed, no additional investment is called for.

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[25] Quite a number of ingenious business cycle models have been built along these lines. See for instance J. Tinbergen, "Annual Survey: Suggestions on Quantitative Business Cycle Theory," *Econometrica*, Vol. III (July, 1935), pp. 241–308. Particularly attractive is the variation in which the increase in productive capacity appears not only with a lag, but is also bunched. Thus if the construction of a factory and the installation of equipment take, say, two years, costs (wages, salaries, etc.) are paid out gradually over the whole period, while capacity remains constant for two years and then makes a sudden and sizable jump. See Albert Aftalion, "The Theory of Economic Cycles Based on the Capitalistic Technique of Production," *The Review of Economic Statistics*, Vol. IX (October, 1927), pp. 165–170. This article contains a summary of his theory.

To summarize, opportunities for induced investment may appear when:

1. Excess capacity is absent and income increases faster than capacity.
2. When some firms or industries face potential losses.

IV. LOSSES AND MONOPOLIES

To maintain full employment we need a growing income, and to achieve a growing income (without a drastic change in the propensity to save) we need an ever-increasing stream of investment. Now, if investment were merely an income-generating instrument, many of our difficulties would disappear; why should anyone object to a larger income so long as we don't run into an inflation? But—and this I am sure sounds like a paradox—the main opposition to investment arises from the fact that investment is also a productive instrument which enlarges our productive capacity.[26] Moreover, the effects of investment on national income and on productive capacity are far from symmetrical.

Any investment project—a dwelling or a machine—generates income while it is being built. It is true that, because of the multiplier effect, the project creates income several times the amount invested in it, but this increase in income is temporary and presently peters out, while productive capacity is increased more or less permanently.[27] Or, looking at the problem from another point of view, we can say that any positive amount of investment (over and above depreciation) increases productive capacity; but only its increment (over the preceding period) raises national income.[28] Therefore in a well-developed capitalist economy, like the United States, the increase in productive capacity is much easier to achieve, and it is more likely to happen, than a corresponding increase in income.

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[26] "The tragedy of investment is that it causes crisis because it is useful. Doubtless many people will consider this theory paradoxical. But it is not the theory which is paradoxical, but its subject—the capitalist economy."—Michal Kalecki, *op. cit.*, p. 149.

There is also another important difference between these two effects of investment. The increase in income generated by a given increment in investment is by its nature indirect and diffused, while the effect on productive capacity is usually limited to one or a few industries. If a new tire factory is built in Akron, for example, the effect of this investment on income will be spread far and wide, and only a small fraction of this additional income will come back to Akron and be spent on tires. But the new tire factory, with its increase in productive capacity, is in Akron, and it competes for labor, raw materials and markets with previously constructed plants in the same location.

In this country, competition for labor and raw materials is usually not a very serious matter in peace time, but the struggle for markets is a real one. And in this struggle lies the source of opposition to new investment.

Being a productive instrument, every piece of investment is first of all a potential substitute for some other productive instrument —capital or labor.[29] If it is labor that is replaced and if much labor remains unused, we have unemployment—a subject which need not be discussed here. If capital is replaced instead, its owners may suffer a loss. On *a priori* grounds it is impossible to say whether the new productive instrument will compete with labor or with capital; most likely both effects will be present to some extent.

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[27] Since the whole discussion is carried out in terms of net investment (over and above depreciation), we have a right to proceed on the assumption that depreciated assets are replaced by new ones.

[28] See my paper, *loc. cit.*

[29] It is also possible that the new capital competes with a natural resource. If so, the owners of the latter may also suffer a loss.

It is of course possible that while the new investment is being built, it, together with other investments, raises national income to a new height, so that there is enough room for everyone. New investments can find a market without pushing older ones out. In this case potential losses faced by the owners of old capital goods do not materialize, and may even turn into gains. Such a situation was of course quite frequent in this country prior to 1929. That is how the country grew. But the trouble is that no firm can take this relieving rise in income for granted, particularly in view of our performance in the 'thirties.

The attitude of the typical firm to this problem is to assume that income will remain constant, or more correctly, that whatever its magnitude is going to be, it will not be affected by the actions of the firm itself and of its close rivals. It then follows that the correct course to pursue is to prevent rival investments from taking place (and to limit one's own), so that the market is not captured by rivals, or in any case is not "spoiled" by excess capacity. It is not that the firm objects to investment in general. The income-generating properties of the latter are well known. Investment in general is highly welcome, provided it does not result in the production of goods and services which compete with those of our firm. But when all firms think and behave in this manner, the economy may be headed for serious trouble.

A mere objection to new investment is of no importance unless it is combined with ability, either by force, threat, or agreement, to prevent the new asset from being built. It is here, I believe, that monopolies do the greatest harm to our economy. The textbook demonstration of how a monopolist curtails output and raises prices rests on a very shaky foundation because a monopolist (or an oligopolist) does not have the same cost curve he would have if he ran a small plant in a competitive industry. And even if his actions do result in higher prices, the harm to the economy is small as compared with that resulting from insufficiency of investment. It is not the monopoly in the narrow technical sense that matters,

[redacted]

but rather bigness in general, which gives small groups of industrialists and financiers—and also some labor leaders, for that matter—tremendous power to prevent developments which may inflict a loss on themselves. For in a private economy it is impossible to make a single investment without inflicting a potential loss on oneself or on someone else!

We may imagine representatives of our big business, perhaps together with those from big labor, sitting around a table. All prospective investments are placed on a platter and passed around. The representative of General Motors might, for example, find all of them splendid, all with the exception of Kaiser–Frazer's new plan for expansion. He takes this one project off and passes the platter on. Pennsylvania Railroad has no objection to Kaiser–Frazer and to all other such projects, but it might decide to veto the St. Lawrence waterway. Its views are seconded by United Mine Workers whose behaviour is undistinguishable from that of their business associates at the table. The platter moves on. Real estate interests think that it was a great pity that Kaiser-Frazer and the St. Lawrence were taken off the platter; those were fine projects to achieve prosperity and to raise the American standard of living. The construction of a plant for prefabricated houses, however, is a different matter. That will destroy existing real estate values. And so it goes. By the time the platter completes its trip around the table it is perfectly empty; all projects have been vetoed by one or the other participant. And there goes our prosperity.

If the participants were small and weak, as they are supposed to be in an atomistic society, their vetoes would be just empty talk. On the other hand, if the whole economy were ruled by one closely connected financial group, the latter would not treat the level of income as independent of its own actions, and would find it profitable to invest and expand in many different directions. The gains to the economy as a whole would of course outweigh the losses. Similarly, if the participants at the table could get together and talk things over, each of them would realize his dependence on all the rest, and might agree not to veto the projects, since an empty platter means ruin for everyone. It would even pay the rest to compensate a particularly injured member for his losses in order to remove his opposition. But we may be caught in a situation where the participants are frequently not weak enough to be harmless, and yet not large enough or not sufficiently well organized to perceive the effects of their own action on total income. We should not forget that to lose a few thousands when everyone else is supposedly making money is to lose face and standing. But to lose millions when everyone else is losing millions is perfectly in accordance with sound business practice. No single individual or firm, however large, can be blamed for a depression.

V. CONCLUDING REMARKS

The discussion in Sections I–III shows that our main investment opportunities should spring in the future from technological progress and aggressive competition, and to some extent from induced investment, particularly when the latter is caused by a capital loss. That aggressive competition cannot take place in a "safe" atmosphere where no losses may be inflicted is obvious. And the same holds true to a great extent regarding technological progress if new productive devices are not merely financed from depreciation reserves—a process which is perfectly useful in itself, but which will not give enough investment to maintain full employment. And as soon as technological progress gives rise to new investment not financed in this manner, potential losses become inevitable.

We must recognize the important, though uncomfortable, fact that economic progress in our society is a cruel and destructive process, which on one side can result, and indeed has resulted, in a remarkably high and ever-rising standard of living, and on the other—in the destruction of firms and even whole industries. But attempts to tame it so as to achieve safety and security for some, without at the same time introducing some measure of economic planning, may well result in chronic unemployment and insecurity for all.

III

Income-Consumption Relations and Their Implications

BY

JAMES S. DUESENBERRY

OF ALL the new ideas introduced by Keynes in *The General Theory*, the concept of the "consumption function" was the easiest to accept. Few wished to deny that consumption expenditures are primarily determined by income; Keynes' arguments for the stability of the relationship were cogent enough to convince a great number of economists. The opportunities for empirical work opened up by the introduction of the new concept were at once apparent. Here, for once, was a theoretical relationship which involved magnitudes which could be measured not merely theoretically but practically. Econometricians went to work with a will and their efforts were amply rewarded. They were not only able to find a relationship between income and consumption, but they found that virtually all of the variation in consumer expenditures was explained by variations in income.

Yet, in spite of these empirical successes, the consumption function is a more controversial subject today than it was ten years ago. For empirical investigation has yielded not one consumption function but many, and each of them explains all the variations in consumption.

Like most economic magnitudes the literature on the consumption function seems to grow according to the compound-interest law. This would be easy to understand if the literature appeared as the result of the discovery of new data. But no fundamental changes in our knowledge of the facts about income and consumption have occurred in the past five years.

Most of the articles on the consumption function present hypotheses about the relation between consumption, income, and some other variable such as time, the price level, or the degree of unemployment. The hypothesis is presented in the form of an equation which makes consumption a function of the other variables. The appropriate regression is fitted to the data, and the correlation between the observed and calculated values of consumption or saving is computed. The correlation is invariably high, and most writers seem to be satisfied that a high correlation coefficient provides an adequate test of their hypothesis. But a test which is passed by so many different hypotheses is not a very satisfactory one. Before any more consumption functions are introduced it seems desirable to give some consideration to our methods of testing hypotheses.

In Section I it is shown that aggregate hypotheses cannot be adequately tested by the use of correlation analysis. The general principles on which appropriate testing methods can be developed are then discussed. Section II is devoted to a consideration of the possibility that the relation between saving and income is different at different points of the trade cycle. A test based on the principles developed in Section I shows that we must reject the hypothesis that the saving-income relation is invariant with respect to measures of position in the trade cycle.

In Section III hypotheses which explain both cyclical and secular movements of savings are developed. It is shown that these hypotheses are consistent with: (1) the long-run data on income and consumption given by Kuznets, (2) the annual data on income and consumption in the period 1923–1940, (3) the budget study data collected in 1935–1936 and 1941. These hypotheses lead to the conclusion that aggregate saving out of disposable income can be estimated by the equation $\frac{s_t}{y_t} = .165\,\frac{y_t}{y_o} - .066$, where s_t = current savings, y_t = current disposable income, y_0 = highest disposable income ever attained, with all variables corrected for population and price changes.[1]

I. TESTS OF AGGREGATE HYPOTHESIS

When we deal with a problem in aggregate economics we usually seek for relationships which are, in some sense, invariant. By invariance we do not mean a historical invariance like the Pareto law. Rather, we mean that the relationship between a certain set of variables is unaffected by changes in some other variables. The concept of an invariant relationship is therefore a relative one; a relation may be invariant with respect to one set of variables, but not with respect to some others. Indeed it might be said that hardly any economic relationship can be regarded as completely invariant. For no economic relation is likely to continue to hold good both before and after a fundamental change in social organization. In fact, one of the objects of economic policy is the modification of social organization in such a way as to produce relations of a desirable type among economic variables.

Our idea of invariance is somewhat as follows: We conceive that at any one moment certain variables within the control of households or firms are related in a definite way to certain other variables not within their control. For example, we suppose that the consumption expenditure of families depends on their income. The form of these relations is governed by the behavior characteristics of individuals and by institutional factors such as laws or customs. The relations we seek are invariant with respect to all variables except these psychological or institutional factors. A relation which satisfies that criterion may be said to be more or less stable according as these factors are more or less constant. We can make satisfactory predictions if we can find invariant relations of this type which are highly stable.[2]

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[1] Part of this paper was presented at the meeting of the Econometric Society in January, 1947. At the same meeting Prof. Franco Modigliani presented a paper containing an almost identical income-saving relation.

[2] Finding invariant relations of this sort actually helps in only one kind of policy problem. We may conceive of the "structure" of the economy as being

If an invariant relation of this type holds for the variables associated with individual households or firms, then a corresponding invariant relation must hold among some functions (not necessarily sums) of all the household or firm variables of the same kind. If we can write $y_i = f_i(x_i)$ for every household (when x_i and y_i are variables applying to the ith household), then we can write $\emptyset(x_1, x_2 \ldots x_n, y_1, y_2, \ldots y_n) = 0$. The invariance of the second relation will depend on the constancy of the behaviour characteristics and institutional elements which determine the invariance of the original relations, and in some cases on the constancy of the distribution of the x's. Aggregate relations which can be deduced from household or firm relations, I shall call fundamental aggregate relations. (There are of course some additional fundamental aggregate relations which are definitional and need not be deduced from anything.)

Now consider a pair of such fundamental aggregate relations:

$$(1)\quad \emptyset_1(x_1\, x_2 \ldots x_n) = \psi_1(y_1\, y_2 \ldots y_n)$$
$$(2)\quad \emptyset_2(x_1\, x_2 \ldots x_n) = \psi_2(z_1\, z_2 \ldots z_n)$$

where the x's are exogenous variables.

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described by a certain set of invariant relations. Then one kind of policy consists in fixing the values of certain of the variables which enter into these equations without otherwise disturbing any of the relations. Fixing an interest rate or tax rate is a policy of this sort. If we know all the invariant relations necessary to describe the structure, we can predict the effect of this sort of policy (at least in the sense that we can assign a probability to any values of any economic variable at each point in the future).

On the other hand, many of the most important policies involve changes in the structure. If a law is changed which has never been changed before, then we may know that certain structural equations will be changed, but we may not be able to foretell exactly what the new equations will be like. Or, to take a simple example, if the Treasury undertakes a campaign to get people to save more, it will be difficult to know what its effect will be. For this is an attempt to induce changes in behaviour patterns, and we have comparatively little experience with this kind of change. The kind of data with which economists deal is not likely to reveal anything about the possible effects of the Treasury's campaign. On the other hand, a sufficiently general theory of behaviour ought to make a prediction possible, but this would be entirely a question of social psychology.

As a matter of fact, it seems probable that most of the economic policies of really fundamental importance involve structural changes of this sort. To the extent that this is true, economists can be regarded as competent to judge the effect of these policies only by default on the part of the social psychologists.

It is clear that a further relation (3) $x_1(y_1\ y_2\ .\ .\ .\ y_n) = x_2(z_1\ z_2\ .\ .\ .\ z_n)$ may be derived from the first two. Further, this relation will be invariant so long as (1) and (2) are invariant. This type of relation I shall call a derived aggregate relation.[3]

Now suppose that we observe the historical invariance of the relation (3) and conclude that it is a fundamental relation. We might then conclude that by changing the z's we could manipulate the y's. But we might find instead that we had merely invalidated the relation (2) without having any effect at all on the y's or x's. Derived relations like (3) may break down either as a consequence of policy changes or of structural changes in the economy. In addition there is an important class of derived relations which are likely to hold good only during the course of a single trade cycle. For example, a certain variable z may be partly dependent on the level of unemployment. Within the course of a single trade cycle, income is very closely associated with the level of unemployment. If we have data covering only a single trade cycle, we might conclude from the empirical evidence that z is determined by income. Actually we have a derived relation between z and income, which is bound to break up because the upward trend in income will ultimately change the association between income and unemployment. It is clear from these considerations that many of the relations observed empirically may be only derived relations which will break down because of a structural change in one of the fundamental relations on which they are based. This is particularly true of relations whose existence has been tested against the data of only a single trade cycle. Whether we are concerned with policy or with prediction, we shall often make errors if we treat derived relations as though they were fundamental ones. The difficulty of distinguishing between these two kinds of relations is one of the fundamental difficulties in testing economic hypotheses.

Let us now return to a consideration of the adequacy of correlation methods of hypothesis testing. Suppose we have a hypothesis which asserts that total consumer expenditure is dependent on disposable income. We can fit a regression to the data for income and consumption and compute the correlation coefficient. When we find a significant correlation, what, exactly, have we found? We have not shown that the "data are consistent with the hypothesis." We have merely disproved the null hypothesis. That is, we have shown that the association between income and consumption was too strong to allow us to ascribe it to chance. Then we should be reasonably confident in asserting that we have found either (a) a fundamental relation between income and consumption, or (b) a derived relation between them. We might exploit our results a little further. If it could be shown that the lower confidence limit on the correlation was (say) .95, we could assert that during the period income was linearly related to all the variables fundamentally related to consumption. But this is about as far as we can safely go. It can be argued, of course, that a derived relation will tend to produce lower correlations than a fundamental relation. But, when our data cover only short periods, the connections between economic variables may be so close that the differences in correlations between the two sorts of relations may be too small to be statistically significant. Moreover, if the variables in a derived relation have a lower observational error than those in the fundamental relations, the correlation in the derived relation may be the higher one.

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[3] Cf. T. Haavelmo, "The Probability Approach to Econometrics," *Econometrica,* July, 1944, Supplement.

A very simple example of a derived relation is that which appears to have existed between consumer expenditures in dollars and disposable income in dollars during the period 1929–1940. Just as good a correlation is obtained by using undeflated as deflated data. This can be true only because the price level was related to income during the period. If real consumption is fundamentally related to real income, the money relationship is a derived one and will break down in the postwar period. Conversely, if money consumption is fundamentally related to money income the relation between the real variables is a derived one and will break down. Now it is obviously of vital importance to know which is the fundamental relation, but the correlation test is not very helpful.

The difficulties we have just been discussing arise because of the existence of derived relations among aggregate variables. But, ordinarily, such derived relations will not hold for individual firms or households. This suggests that in testing hypotheses we ought to operate on the following principles. First, every hypothesis ought to be stated in terms of the behaviour of individual firms or households, even when we are only interested in aggregate results. This does not, of course, prevent us from considering interactions among individuals, any more than the use of the theory of the firm in analysis of monopolistic competition prevents us from dealing with interactions among firms. Second, in so far as it is possible, we ought to test our hypotheses against data which indicate the behaviour of individual households or firms. This does not mean that we ought to abandon statistical procedures. Nearly every hypothesis has to allow for random elements in behaviour so that in making tests we have to measure the average behaviour of groups. But by dealing with relatively small groups we may escape the net of interrelations which makes it impossible to test aggregate hypotheses.

Suppose we are faced with the following situation: One hypothesis asserts that saving varies with income and the price level, another asserts that saving depends on income alone. Aggregate income and the price level are related in the period for which data are available. Then, if one of these hypotheses is true, it will be impossible to disprove the other by means of aggregate data alone. But, while movements of aggregate income may have been correlated with those of the price level, there are certainly some individuals whose incomes moved in a different way. By studying the behaviour of those individuals it will be possible to disprove one of the hypotheses. When this has been done the parameters in the chosen relation may be fitted by the use of aggregate data (though in some cases this may still be difficult because of multicollinearity).

Of course it will not always be possible to find the data necessary to test every hypothesis. But there is a great deal of microeconomic data, which has never been properly exploited because of the tendency of econometricians to emphasize parameter fitting rather than hypothesis testing. Actually it is much more important to work with a true hypothesis than to make extremely precise estimates of parameters.

II. CHANGES IN INCOME AND THE RATE OF SAVING

In this section we shall apply the method just suggested to some questions about the consumption function. In the view of a number of writers, notably Smithies and Mosak,[4] consumer expenditures are essentially dependent on the prevailing level of disposable income. The effect on consumption of an increase in income is supposed to be the same whether the increase comes about through a rise of employment during recovery from a depression or through a rise in productivity in a period of sustained full employment like that of the twenties. Professor Hansen [5] and Professor Samuelson [6] have maintained for some time that the relation between income and consumption varies through the trade cycle. Mr. Woytinski [7] and Mr. Bean [8] have made similar statements and have tried to test them empirically. They obtained correlations just as good as the others but no better, and certainly cannot claim to have disproved the alternative hypothesis. There is, however, some evidence which proves nearly conclusively that the consumption function is cyclically variable though not quite in the ways suggested by Bean or Woytinski.

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[4] "Forecasting Postwar Demand, I, III," *Econometrica*, January, 1945.

[5] *Business Cycles and Fiscal Policy*, New York, W. W. Norton & Company, 1941, pp. 225–249.

[6] "Full Employment after the War," in *Postwar Economic Problems*, edited by S. E. Harris, New York, McGraw Hill, 1943.

[7] "Relationship between Consumer's Expenditure, Savings and Disposable Income," *Review of Economic Statistics*, January, 1946.

[8] "Relationship of Disposable Income and the Business Cycle to Expenditure," *Review of Economic Statistics*, November, 1946.

This evidence is provided by the budget studies made in 1935–36 [9] and 1941.[10] One of the remarkable results of the Study of Consumer Purchases of 1935–36 was that a great number of families reported expenditures in excess of income for the year. The average deficit of the under $500 a year group amounted to 50 per cent of income, while the average deficit of the $500–$1000 group was 10 per cent of income.[11] The results of the 1935–36 study are not above criticism, of course, but the fact that deficits were reported in every city and every area, together with the independent evidence of studies like those of Gilboy, Clague, and Powell, makes it clear that very substantial deficits did occur during the depression.[12]

The total deficits of urban and rural non-farm families (who were white and not on relief) alone amounted to 593 million dollars for 1935–36. Since total net savings of consumers during the twenties and thirties varied from $7.6 to $2.0 billion, an explanation of the deficits can contribute a good deal to our understanding of variations in saving.

But the real significance of the deficits does not lie in their magnitude but in what they reveal about the relations between income and saving. We shall first show that the deficits arose largely because families whose income fell in the depression tried to preserve their pre-depression living standards. Families in the higher income groups did the same thing but accomplished it by reducing their rate of saving rather than by dissaving. The analysis of the deficits is important chiefly because it helps us to analyze variations in the positive savings of higher income groups.

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[9] Summarized by the National Resources Committee in *Consumer Expenditures in the United States*, Washington, 1938; *Consumer Incomes in the United States*, Washington, 1939; *Family Expenditures in the United States*, Washington, 1941.

[10] Bureau of Labor Statistics, Bulletins 723 and 724.

[11] *Family Expenditures in the United States*, p. 1.

[12] Elizabeth Gilboy, *Applicants for Work Relief*, Cambridge, Harvard University Press, 1940. E. Clague and W. Powell, *Ten Thousand Out of Work*, Philadelphia, University of Pennsylvania, 1933.

Let us first consider what kind of people were in the low income groups in 1935–36. While there is little direct information about the low income families in 1935–36, a rough estimate of their composition can be made from the data on income and employment in 1939 contained in the Census of 1940. Table 1 shows the result of this estimate.[13]

TABLE 1

White Urban and Rural Non-Farm Families with Incomes under $1000 in 1935–36

	RELIEF	NON-RELIEF
Retired	600,000	600,000
Independent Business and Professional	100,000	600,000
Partially or Fully Unemployed	2,100,000	1,900,000
Fully Employed	—	2,400,000
Total	2,800,000	5,500,000

In the nature of the case this estimate can be only a rough one since it has to be based on a number of unverified assumptions. Yet there does not seem to be much doubt that the non-relief low-income families included a high proportion of families whose incomes were low because of unemployment and whose incomes were much higher in periods of full employment. Moreover, some of the families in the independent business and professional group would have higher incomes in more prosperous periods. Finally, some of the fully employed wage and salary workers were downgraded from higher wage jobs so that their normal incomes were higher than the incomes reported in 1935–36.

(1) Keeping these considerations in mind, let us now ask what

[13] This estimate was obtained by reconciling the data given by the National Resources Committee on numbers of families with incomes under $1000 in 1935–36 with the data in the Census of 1940 on the family wage and salary income and employment in 1939. See *Family Expenditures in the United States*, pp. 123, 127, 130 and Census of 1940, *The Labor Force* (*Sample Statistics*), *Wage or Salary Income in 1939* and *Family Wage or Salary Income in 1939*.

is the significance of the deficits for the theory of saving. A supporter of the view that saving depends on real income would say, presumably, that $\frac{c}{y} = f(y)$ and that $\frac{c}{y}$ exceeds 1 for some positive value of y (where y is in constant prices). When that value of y is reached, those who have assets or credit will have deficits; the others will have to be content with spending all of their income.

In its simple form this position is untenable, for the break-even point (the income at which consumption just equals income) stood at about $800 in 1917 and $1500 in 1935–36, using 1941 prices in both cases.[14] If consumption were merely a function of current income the break-even level of income should have remained the same. To this the sophisticated Keynesian will reply by introducing a trend factor. Consumption at a given level of income can be changed by the introduction of new goods (this is about the only factor likely to cause a trend in the consumption of urban families, and these are the families included in the budget studies in question). For the sake of the argument let us agree that introduction of new goods in itself increases consumption at a given level of income. We know too that families in the low income groups were driving automobiles and using various recently introduced household appliances. This does not advance the argument much, however, for the families in question were for the most part using these things rather than buying them. We can turn to other new goods, movies and silk stockings (say), which were also consumed by the low-income groups in the thirties. Let us grant that a family with an $800 income did not buy these things in 1917 and did in 1935. Then it follows that at least part of the deficits in the thirties were due to the fact that low income families bought new goods which did not exist in the earlier period. But this is not the whole story. We can say on the one hand that families at an $800 income level in the thirties spent more than families with that income in 1917 because they had become used to a high standard of living (including silk stockings and movies) in the twenties and found it difficult to give up. Or we can say that even if income had remained constant from 1917 to 1935 the attraction of these new goods was so irresistible that they incurred deficits to get them (or at least that they would have done so if they had had the necessary assets or credit). The latter position seems to be a somewhat untenable one. But, if we argue that consumption depends on current real income and trend, that is the position which must be maintained in order to explain the facts. For, if we write $\frac{c}{y} = f(y,t)$, nothing has been said about the influence of past living standards on current consumption.

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[14] See G. Cornfield, W. D. Evans, and M. Hoffenberg, "Full Employment Patterns in 1950, Part I," *Monthly Labor Review*, February, 1947, p. 181.

This does not disprove the proposition that consumption at a given moment is dependent on real income alone; but it does require the supporters of that proposition to subscribe to some very strong propositions about the influence of new products and similar trend factors.

(2) We can make a further test if we compare the deficits reported in 1935–36 with those reported in 1941. Deficits at given levels of income were much smaller in 1941 than in 1935–36. At every level deficits were less than one half as great in 1941 as in 1935–36. How is this shift to be explained? Suppose the deficits, in both cases, were due to the fact that families whose incomes had fallen as a result of unemployment found it hard to reduce their living standards. Then the explanation is easy. The low income group consists primarily of two subgroups: families whose earners are normally fully employed at low wages, and families whose incomes have been reduced by unemployment. The second group will run deficits to protect the high living standard attained when they were fully employed. The first group balances its budget. Suppose now that we have complete data on families in the $1000 income group in two periods. Suppose that the situation is as follows:

	NUMBER	DEFICIT
Fully Employed Families (with normal incomes)	5000	0
Partially Employed Families	5000	$300
Average		$150

Suppose that in a second period we obtain reports from the same group but that half of the families in the $1000 group have increased their incomes. The situation in the $1000 group now is as follows:

	NUMBER	DEFICIT
Fully Employed Families	5000	0
Partially Employed Families	2500	$300
Average		$100

Now suppose that instead of subdividing the families in this way our report had shown only the average deficit of the $1000 income families. We would have observed a reduction in the average deficit from $150 to $100 per family without knowing why. The differences in the 1935–36 and 1941 studies seem to correspond very clearly to the examples just given. In 1935–36 there were about 8 million unemployed, in 1941 there were only 3 million. In 1935–36 a much higher proportion of families in the low income groups were there because of unemployment than in 1941. If, therefore, we accept the proposition that the deficits were due to unemployment, or to incomes low by comparison with previous ones, the difference between the two studies is easily explained.

If we try to support the view that consumption depends on absolute income, how shall we explain the difference? The trend explanation cannot be used in this case. For the break-even point moves in the wrong direction.

We can suppose that the families left in the low income groups would like to have run deficits but were unable to do so because they lacked the necessary assets or credit. But we have argued that a higher proportion of the low income group in 1941 were permanent members of that group than in 1935–36. It follows that the higher deficits in 1935–36 must have been incurred by the group whose incomes had fallen. For those permanently in the low income group were in more or less the same position in both years. Then we have to explain the differences in the reactions of the two groups. There are three possible explanations. (1) The families with temporarily low incomes were technically in a better position to have deficits. That is, they were not more willing to run deficits, but more able to get the resources to do so. (2) The families with temporarily low incomes had expectations of reëmployment and higher income in the future. (3) These families had had higher living standards in the past and were therefore more willing to have deficits to protect their living standards.

If either of the last two factors is influential, then consumption must depend on past income (since this governs the expected level of income at full employment) as well as on current income. In this case a general rise in income to levels above the 1929 peak followed by a fall would bring about a recurrence of the deficits, for the standard of living and expectations of income would be based on the new peak. If income declined from this peak by the same percentage as 1935 income had declined from the 1929 peak, deficits of a relative magnitude as large as those of 1935 would occur. This would be true even if the absolute level of income were as high as the 1929 level. On the other hand if the break-even point is independent of past levels of income no deficits would occur unless income were absolutely low.

The budget study data do not tell us anything directly about which of the three factors just mentioned are actually relevant. We must leave the question open for the moment. However, it should be noted that the hypothesis that consumption depends on past as well as on current income is consistent with all the data discussed so far. The alternative hypothesis that consumption depends only on current income can be made consistent with the data only if we are willing to accept some rather doubtful subsidiary propositions.

(3) One further piece of evidence is available for testing these two hypotheses. The 1941 budget study reported income for the first quarter of 1942 as well as for 1941. Families at each income level were classified by the changes in their income. Savings for the first quarter of 1942 were separately reported for those whose incomes had changed less than 5 per cent, for those whose incomes had increased more than 5 per cent, and those whose incomes had decreased more than 5 per cent from the 1941 level. The results are shown in Table 2. Families whose incomes rose had about the same savings or deficits as those whose incomes stayed the same.

TABLE 2

Average Yearly Savings in 1942 for City Families by Income Change from 1941 to 1942

MONEY INCOME CLASS IN 1942	CONSUMERS WHOSE INCOMES IN 1942 DECREASED OVER 5 PER CENT	CHANGED LESS THAN 5 PER CENT	INCREASED OVER 5 PER CENT
0 to $1000	−337	−35	−15
$1000 to $1500	−181	−34	62
$1500 to $2000	− 81	126	157
$2000 to $3000	0	242	290
$3000 and over	143	1228	1059

Annual rate for 1942 based on first quarter.
Based on B.L.S. Bulletin 724.

On the other hand, families whose incomes fell had much smaller savings or larger deficits than those whose incomes stayed constant. Now these facts can be interpreted in two ways. On the one hand we can say that they show that a rate of change factor is important in the determination of saving. That is, we write $\frac{c}{y} = f(y,y')$ where y' is the rate of change of income. On the other hand we can say that saving is low when income is low relative to past income. The two explanations are not the same. In a year when income is declining, either explanation would lead to the same result. But suppose that income declines and then remains at a (more or less constant) low level. After the decline has stopped, the rate of change is zero but income is still low relative to its pre-depression level.

It is fairly easy to tell which of the two hypotheses is correct. If the rate of change of income is an important factor it should show up in regressions of aggregate data. But it is well known that when the equation $c = f(y,t,y')$ is fitted to aggregate data for the twenties and thirties the addition of the factor y' contributes very little to the correlation. In the face of the budget study data this is difficult to explain unless we accept relative income instead of rate of change as the explanation of the differences in saving at the same level of income.

The asymmetry in the results is also important. If we take the view that rate of change of income is a determinant of saving, then there are strong reasons for supposing that the adjustment lag works in both directions. On the other hand, if we argue that people whose incomes are low relative to their past incomes reduce saving to protect their living standard, the asymmetry is easy to understand. Those whose incomes rose were for the most part getting back to levels of incomes which they had previously experienced. In these circumstances they merely returned to the expenditure patterns of the past and no adjustment lag is involved.

The data just discussed seem to show fairly conclusively that consumption at a given level of income does depend on past income. This hypothesis is consistent with the existence of deficits in 1935–36 and 1941, with the changes in deficits (at given levels of income) from 1935–36 to 1941, with the upward movement of the break-even point from 1917 to 1935–36 and 1941, and with the differences in saving among families whose incomes had changed in different ways. It is difficult to explain all of these facts on any other hypothesis.

Psychological Foundation

So far our argument has been a strictly empirical one. But it must be clear that it also has a strong psychological foundation. The fundamental psychological postulate underlying our argument is that it is harder for a family to reduce its expenditures from a high level than for a family to refrain from making high expenditures in the first place. Consider two families who have incomes of $1000 per year at a particular time. Now suppose one of these families has an income of $1000 per year for ten years thereafter. Suppose the other family gets an increase in income from $1000 to $1500, retains this position for nine years, and then has its income reduced to $1000 so that in the last year it is in the same position as the other family. Initially both families might have exactly balanced their budgets at $1000, and the first family might continue in this way for the whole ten-year period. But when the second family had its income increased it would increase its consumption by (say) $400 and its saving by $100. When the reduction in income occurred it would certainly find it difficult to cut its consumption to the $1000 level. The first family had only to refrain from increasing its consumption expenditures to balance its budget. The second family had actually to give up consumption of $400 per year to achieve the same result. It would be surprising if a family in these circumstances succeeded in reducing its consumption sufficiently to balance its budget after the loss in income.

Since all of the data are consistent with the view that this does happen, there does not seem to be much doubt that past income has an influence on current consumption and saving.

The argument so far has been devoted to explaining the deficits reported in the budget studies. But the significant result of this argument is not the conclusion that deficits will occur when income falls below previously attained levels but the more general proposition that families are willing to sacrifice saving in order to protect their living standard. This proposition applies to all income groups who have suffered losses in income. We can argue in the following way. If a family has a certain income y_o and this income is higher than any previously attained, it will save some amount. This amount will be a function of income $s_o = f(y_o)$. If its income increases the same function will hold. But if after an increase income falls to the original level its saving will be less than $f(y_o)$. If the family's income and saving are low throughout, it will have a deficit after the fall in income. If the family is in a higher bracket it will simply save less after the fall in income than it did before the increase. This view is checked by the fact that savings in the last five years of the twenties averaged 10.2 per cent of disposable income while from 1936 to 1940 they averaged only 9.0 per cent. Real disposable income per capita was almost the same in the two periods.

A Base Year for Downward Adjustments of Consumption

We have now shown that consumption is dependent on current income relative to past income as well as on the absolute level of current income. The problem now is to find just which past incomes are relevant. In view of the argument just given we appear to be safe in supposing that past incomes lower than the current one are not very relevant. This is pretty well demonstrated by the 1941–42 budget figures cited above. Families whose incomes rose to a given level saved about the same amount as those whose incomes had been at that level in the previous year. At first glance then it would seem reasonable to suppose that current consumption depends on the ratio of current income to some weighted average of past higher incomes, with weights decreasing as the time interval involved grows longer. There are, however, some fairly strong arguments against this position. The declines in income which occur in the depression are not uniformly distributed even though the size distribution of income remains more or less unchanged.

Income losses will be of three kinds: (1) reductions in property incomes, (2) reductions in wage rates, (3) losses due to underemployment. Since real wage rates do not decline very much in the depression (and were even higher in the late years of the depression than in the twenties), losses of income are mostly of types (1) and (3). (A fourth class results from downgrading of workers either within or between industries, but for our purposes this can be regarded as underemployment.)

Let us first consider the effect of losses of income in the upper income groups. It is not important here whether the losses are due to reductions in property incomes or to salary reductions. It can be assumed, however, that unemployment among the upper income groups is not important. The upper 10 per cent of the income distribution produces almost all of the positive saving for the whole economy. Moreover, families in this group save a high proportion of their income. This means that they have a good deal of leeway in maintaining consumption standards without running into deficits; also they have more free (non-contractual) saving. When high income families suffer a loss in income, therefore, they continue to live in the same kind of neighborhoods and maintain their contacts with others of the same socio-economic status. In general they maintain the way of life which was established before the onset of the depression. They will, of course, cut expenditures on some lines, particularly on durable goods. But in view of the high rate of savings maintained in prosperity they can absorb a considerable reduction of income by reducing saving without cutting consumption too deeply. Moreover, there is no reason why they should not continue in this position for several years. Suppose now that income falls sharply from a cyclical peak and then remains constant for several years. The peak year's consumption sets the standard from which cuts are made (provided the peak did not represent a mere spurt in income). The higher the peak consumption, the more difficult it will be to reduce consumption to any given level. After the initial reductions are made the situation becomes static. The peak year does not lose its influence because the consumption of the following years depends on the peak consumption. Of course, if income began to fall again further consumption cuts would take place, and the intermediate level of income would be important in determining the extent of the cuts as well as the previous peak income. But if the depression consists in a fall of income lasting only a couple of years followed by a rise or a low plateau, the consumption of the peak year is likely to have very heavy weight in determining consumption in the depression. The influence of the peak consumption will not "fade away" unless income continues to fall steadily.

All of the above argument applies only to the upper income groups. Those who were in the lower 90 per cent of the distribution in prosperity are in a different situation. For this group, reductions in individual income are usually associated with unemployment. These people probably save very little even in prosperous times. In a depression they can only influence saving by having deficits. A considerable number of families in this group go nearly unscathed by the depression. Their real wages do not fall and they never have serious losses of employment. These we may leave out of account since their savings are simply zero throughout. The remaining families suffer serious loss of employment at some point during the depression. These may also be divided into two groups. Some will remain employed up to a certain point, then lose their jobs and never get steady employment again until a high level of prosperity is reached. These families will presumably run substantial deficits immediately after they become unemployed, but as their assets become smaller they will have to adjust to the new situation and presumably balance budgets in which relief is the principal source of income. They may continue to have deficits for a long time, but in any case the influence of the prosperity living standard will certainly "fade away" as time passes. However, it should be noted that not all of the persons who will eventually constitute the "hard core" of unemployment get there at once. The result is that a certain number of families are going through the initial stages of long-term unemployment at any time during the depression. Presumably, however, there are rather more families in this position during the downturn in the early years than later on. We should expect, therefore, to find somewhat greater deficits and lower aggregate savings at a given income in the downturn than in the upturn. However, the total number of families in this group was not very large in the thirties, and the differences in the numbers entering cannot have been great enough to cause numerically important reductions in aggregate savings.

The remainder of the unemployment is widely spread so that a large number of workers "take turns" being unemployed. Families lose income through unemployment and accordingly cut consumption; they also run a deficit. When they get reëmployed they may return to something very close to the prosperity consumption standard. Sometime later unemployment may reoccur and the process repeats. Those families who are very frequently in and out of employment will presumably gradually reduce consumption (even when employed) because of the decrease in their assets and the accumulation of debt. The influence of the peak standard will therefore gradually lose its effect. But a great part of the total unemployment can be accounted for by families who have only one or two stretches of prolonged unemployment during the depression. For these families the influence of the peak consumption standard will not fade away because it renews itself with each stretch of full employment.

We can conclude then that the income or consumption of the last cyclical peak will carry a special and very heavy weight in determining consumption at a given (lower) level of income during a depression. In principle a weighted average of all the incomes from the peak year to the current year ought to be used. But with only a few observations it would be impossible to estimate the weights. In what follows we shall consider the relation of current consumption to the ratio $\frac{\text{current income}}{\text{highest previously attained income}}$ but the results are to be taken as an approximation to the true relation.

If the argument just given is correct, then there is a cyclical component in the explanation of saving. Savings at a given level of income, when income is the highest ever attained, as in the late twenties, will be higher than savings at a similar income level reached in a decline from a still higher level. I conclude, therefore, that in a general way at least the propositions of those who have argued that saving varies with the trade cycle as well as with income are supported by the evidence of the budget studies.

III. AGGREGATE INCOME-SAVING RELATIONSHIPS

So far it has been shown that saving depends on the level of current incomes relative to higher incomes in previous years. But saving also depends on the absolute level of income. We may write then, $s_t = f(y_t, y_t/y_o)$ where y_o is the highest income attained previous to the year t. Then

$$\frac{ds_t}{dy_t} = \frac{df}{dy_t} + \frac{df}{d\left(\frac{y_t}{y_o}\right)} \cdot \frac{d\,(y_t/y_o)}{dy_t}$$

If we plot out the long period relation of saving and income considering only periods of approximately full employment, the term $\frac{dy_t/y_o}{dy_t}$ will be o so that $\frac{ds_t}{dy_t} = \frac{df}{dy_t}$. But, with data covering a trade cycle, $\frac{dy_t/y_o}{dy_t}$ will have a positive value, and, if we use cyclical data to estimate the secular marginal propensity to consume, our estimates will be too high.

If data covering a number of cycles were available, we could take the regression of saving on $\frac{y_t}{y_o}$ and y_t and estimate simultaneously the secular and cyclical components in saving. Unfortunately the period 1923–1940 covers only one major cycle, so that we are forced to estimate the influence of the two factors separately. First, it should be noted that there are strong grounds for supposing that (in the absence of cyclical fluctuations) aggregate saving remains a constant proportion of aggregate income.

This position can be best understood by a consideration of the apparent contradictions in the relations between saving and income. On the one hand, we have the Keynesian dictum that "apart from short period changes in the level of income, it is also obvious that a higher absolute income will tend to widen the gap between income and consumption. For the satisfaction of the immediate primary needs of a man and his family is usually a stronger motive than the motives toward accumulation, which only acquire effective sway after a margin of comfort has been attained. These reasons will lead as a rule to a greater proportion of income being saved as income increases." [15] This argument which, at first glance at any rate, appears very plausible, has had wide acceptance. Moreover, it seems to be supported by important empirical evidence. Every budget study supports the view that families with high incomes save a greater proportion of income than those with low incomes. It is also known that, in the period 1923–1940, saving fluctuated more than in proportion to income. On the other hand, the data given by Kuznets indicate that aggregate saving has been an approximately constant proportion of income for a long time.[16]

From a psychological viewpoint, Keynes' argument about the relative importance of saving and accumulation at different income levels does not throw much light on the situation to which it is supposed to apply. It is no doubt true that a family will not save when its income is so low that it cannot satisfy its immediate primary needs. But in the United States, at least, the problem of getting an income high enough to maintain physical existence has hardly existed (for families whose workers are employed) for many years. The problem is not one of saving vs. consuming enough to maintain existence. It is one of choosing between an immediate comfort and security. Any psychological theory of saving must give an explanation of the resolution of the conflict between the desire for security and the desire for comfort. When the problem is put in this way the conclusion that saving rises more than in proportion to income is not at all obvious. Moreover, in view of the paucity and ambiguity of the empirical evidence a psychological basis is necessary if an adequate theory of saving is to be constructed.

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[15] J. M. Keynes, *The General Theory of Employment, Interest, and Money*, New York, Harcourt, Brace and Co., 1937, p. 97. Reprinted by permission.

[16] Simon Kuznets, *Uses of National Income in Peace and War*, New York, National Bureau of Economic Research, 1942, p. 30.

Such a theory already exists in the form of marginal utility and "indifference map" analysis, but it is hardly adequate for our purposes. The whole structure of preference analysis is based on the assumption that one individual's preferences are independent of the actual consumption patterns of another individual's. It is this assumption which permits us to add up the demand functions of individuals to get a market-demand function.

Yet consumption preferences can hardly be regarded as innate characteristics of individuals. Nor can they be regarded, in a society as dynamic as ours, as being determined by tradition. There is a great deal of evidence to show that consumer tastes are socially determined. This does not mean that consumer tastes are governed by considerations of conspicuous consumption. Rather, it means that any individual's desire to increase his expenditure is governed by the extent to which the goods consumed by others are demonstrably superior to the ones which he consumes. If we can assume that the degree of superiority of one set of goods over another is highly correlated with the relative costs of obtaining these goods, we are led to the following proposition. The strength of any individual's desire to increase his consumption expenditure is a function of the ratio of his expenditure to some weighted average of the expenditures of others with whom he comes in contact. The weights are determined by the social character of these contacts. If the distribution of income is constant (in the Lorenz curve sense) this weighted average can be regarded as a function of an individual's percentile position in the income distribution. The proportion of income saved is set by balancing the desire to increase current consumption against the desire to increase assets relative to current consumption (that is, to have a greater assurance of continued maintenance of the existing standard). We may therefore conclude that if the strength of the desire to increase consumption is a function of percentile position in the income distribution, the proportion of income saved will be a function of the same variable. It is also easy to see that it will be a rising function.[17]

This hypothesis leads to the following conclusions:

(a) At any one moment the proportion of income saved will be higher for the higher income groups than for low income groups:

(b) If income increases, while the proportional distribution remains constant, the ratio of aggregate saving to aggregate income will be constant.

Both of these conclusions are in accord with known facts.

If we accept the hypothesis just given, then secularly consumer saving will be a constant proportion of disposable income.

This hypothesis, together with the cyclical relation, considered in Section II, should give a complete explanation of variations in saving.

If the secular relation between savings and income makes for a constant income-saving ratio, the *proportion* of income saved will depend only on cyclical factors.[18] Then we may write $\frac{s_t}{y_t} = F\left(\frac{y_t}{y_0}\right)$. There is not much basis for selecting any particular functional form for $F\left(\frac{y_t}{y_0}\right)$. However, a linear approximation, which fits the data well, is always satisfactory, provided that we do not have to make predictions involving values of the variable outside the range of the data used in fitting the approximation. In the period 1923–1940 values of $\frac{y_t}{y_o}$ ranged from about 1.1 to .5. It seems unlikely that income will ever decline to less than 50 per cent of full employment levels, so that we can be safe in using a linear form for $F\left(\frac{y_t}{y_o}\right)$ for prediction. When the relation $\frac{s_t}{y_t} = a\frac{y_t}{y_o} + b$ is fitted to the data for the period 1923–1940, we obtain $a = .165$, $b = .066$.[19] The correlation is .9, which is as good as that usually obtained for relations between savings and income.

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[17] In a paper of this length it is impossible to go too deeply into the theory of consumer behaviour underlying the above propositions. This theory together with some empirical tests of its adequacy will be developed more fully in a forthcoming paper.

[18] If we accept the proposition that the high marginal propensity to consume indicated by linear income consumption relationships is largely due to cyclical factors, there is no *evidence* of the existence of any powerful trend in consumption. Various factors which might have caused either an upward or a downward trend can be cited. But when we have a hypothesis which explains all the data there is no point in introducing a trend unless some evidence of its operation can be given.

However, the correlation is not the test of the adequacy of the relation. The test is based on the fact that the secular average propensity to consume is predicted by the relation just given. In a period when income is slowly rising with only minor cyclical fluctuations, each year's income should be slightly above that of the preceding year. $\frac{y_t}{y_o}$ should be about 1.02 in each year. If we put $\frac{y_t}{y_o} = 1.02$ in the relation $\frac{s_t}{y_t} = .165\,\frac{y_t}{y_o} - .066$ we obtain $\frac{s_t}{y_t} = .102$ which is very close to Kuznets' estimate of the (stable) savings ratio in the period 1879–1919. Since the regression was based on the period 1923–1940 we may say that the regression "predicted" the Kuznets' results.

All three major sources of data about income and consumption are consistent with the two hypotheses, (1) that secularly an individual's propensity to consume is a function of his position in the income distribution (which implies that aggregate saving tends in the long run to be a constant proportion of income) and (2) that, cyclically, the aggregate propensity to consume depends on the ratio of current income to the highest income previously achieved. They are also consistent with the internal evidence of the budget studies and with the results of intertemporal comparisons of budget studies. So far as I am aware there are no data about saving and income which are inconsistent with these hypotheses.

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[19] The data used are those given by E. G. Bennion, "The Consumption Function Cyclically Variable," *Review of Economic Statistics*, November, 1946. Disposable income and savings are both corrected for price and population changes.

There is, however, another important class of hypotheses which has not been considered here. These are the hypotheses which introduce variables other than income into the consumption function. In particular it has been suggested that saving may vary with the price level (when the price level is considered as a separate variable and not as a mere deflator) and with the value of assets. There is, of course, no real conflict between these hypotheses and the ones presented here. The two variables just mentioned are highly correlated with income, so that it is quite possible that they may be important contributors to the variance of saving, even though a high correlation can be obtained without considering them. These hypotheses will have to be tested by methods similar to those used in Section II of this paper.

The implications of the hypotheses developed here are fairly obvious. We may expect that, when the transition period is completed, consumer savings will fall to around 10 per cent of disposable income. This may be compared with the estimate of 14 per cent given by Smithies for consumer savings out of a disposable income of 158.2 billion dollars in 1943 prices.[20] The volume of offsets to savings required to maintain full employment is therefore considerably smaller than would be expected from estimates based on simple income-consumption regressions.

The relation $\frac{s_t}{y_t} = .166 \frac{y_t}{y_o} - .066$ has the property that the marginal propensity to save out of disposable income is fairly high with respect to cyclical movements of income, but the average propensity to save is much lower and does not tend to rise with secular increases in income. During the trough of a cycle (from the time income falls below the peak value for one cycle until it rises above that value in the next cycle) $\frac{y_t}{y_o}$ is dependent entirely on y_t (since y_o is constant). We have then $s_t = \frac{.166}{y_o} y_t^2 - .066y_t$; then $\frac{ds_t}{dy_t} = .332\frac{y_t}{y_o} - .066$. The marginal propensity to save with respect to decreases in income is therefore about .26 at the peak of a cycle. As income declines $\frac{ds_t}{dy_t}$ falls until it reaches zero at an income equal to one-fifth that of the last cyclical peak.

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[20] *Vide* A. Smithies, "Forecasting Postwar Demand," *Econometrica*, January, 1945.

On the other hand, the average propensity to save does not rise as income rises secularly. For in the upswing of a cycle after full employment is reached, y_o and y_t move together. If income increases steadily at an annual rate of 3 per cent, $\frac{y_t}{y_o}$ is constant at a value of 1.03. The long-run savings function is therefore $s_t = .166(1.03)\ y_t - .066y_t$ or simply $s_t = .102\ y_t$. Thus the cyclical marginal propensity to save is (in the relevant range) higher than the long-run propensity to save, and the use of cyclical data to estimate the long-period relationship leads to invalid conclusions.

IV

Concepts and Criteria of Secular Stagnation

BY

BENJAMIN HIGGINS *

OF ALL the ideas associated with the name of Alvin Hansen, none has aroused more acrid controversy than his doctrine of secular stagnation or economic maturity. A fair share of the controversy can be traced simply to differences in interpretation of the stagnation concept. The differences are partly the result of Professor Hansen's failure to state his thesis clearly and precisely in one place, and partly the result of misinterpretation of what Professor Hansen has stated. The task of this paper is to lend precision to the concept, to suggest what kinds of empirical tests are valid and what kinds are not.

It is the writer's opinion that for the doctrine of economic maturity to have an independent meaning of its own, it must be distinguished from all types of *cycle theories,* and treated as a theory of *long-run trend.* It is also my opinion that Professor Hansen himself considers the doctrine as essentially a theory of long-run trend, despite occasional statements that might suggest another interpretation of his views.[1]

In its briefest and most general form, the stagnation thesis states that highly developed countries like the United States face not only a problem of recurring cyclical unemployment, but also a problem of chronic and growing unemployment resulting from the tapering off of long-run economic expansion. While the economy may still have room for considerable potential expansion, and may indeed still be expanding over the course of cycles as a whole, there is a growing gap between the trend of gross national product at full employment and the actual trend of gross national product. This version of the stagnation thesis, which I believe to be the correct one, is illustrated in Figure V.

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* The author wishes to express his appreciation of the stimulus provided by the members of his graduate seminar, and particularly by Robert Joyce, Arthur Leymer, Maria Paiva, and Sterling Suggett, whose dissertations are related to the subject of this essay.

[1] Cf. Part II, p. 91 below.

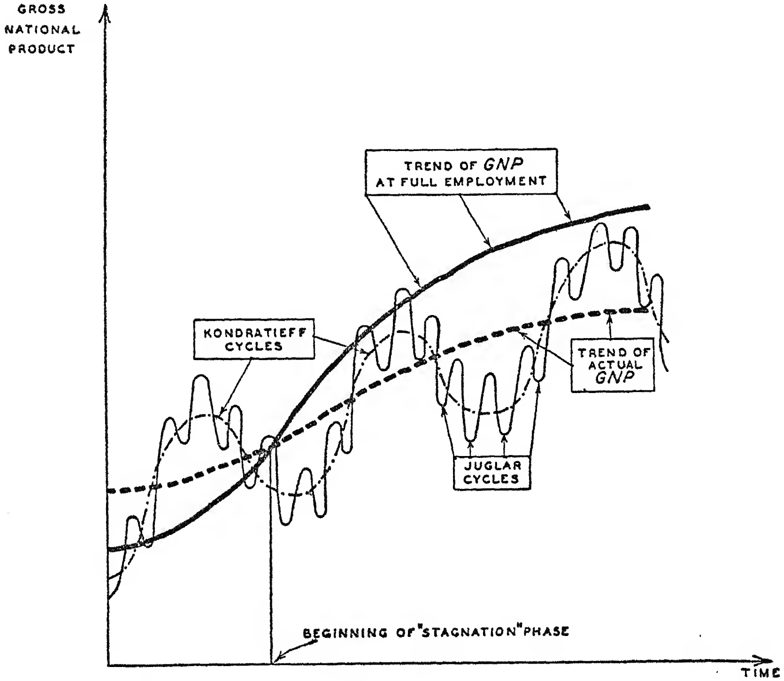
GROSS NATIONAL PRODUCT
TREND OF GNP AT FULL EMPLOYMENT
KONDRATIEFF CYCLES
TREND OF ACTUAL GNP
JUGLAR CYCLES
BEGINNING OF "STAGNATION" PHASE
TIME

FIGURE V

THE CONCEPT OF STAGNATION

The resistance to this thesis is not hard to explain. Because of the time at which the thesis was first presented and Professor Hansen's relation to the Roosevelt administration, the doctrine was linked in the public mind with "New Deal economics" in general, and the intensity of political feeling aroused by the New Deal was transferred in some measure to the thesis itself—even, I fear, to some of the academic discussion of it.[2] Also, the stagnation thesis seems to raise more serious doubts as to the efficiency of the free private enterprise economy than a mere theory of business cycles, and to justify government intervention of a more continuous and drastic nature. For example, the compensatory fiscal policy associated with the theory seems to require a long-run rise in national debt. Finally, the doctrine seems to question the virtue of saving, and the title of savers to a reward.[3]

The identification of the stagnation thesis with a particular political viewpoint is surely most unfortunate. The question is of the utmost importance for the theory of economic development, as well as for economic policy, and economists must endeavor to raise the level of discussion to one of objective science.

I. DEVELOPMENT OF THE STAGNATION CONCEPT

As Professor Hansen himself points out, the literature of economics has almost always contained a doctrine of economic maturity.[4] Indeed, any theory of economic expansion has implicit in it a theory of economic stagnation, and a theory of economic decline.[5] Unfortunately, few economists have stated clearly their concepts of economic trend and its causes, and the interpretations suggested in the present essay may well be subject to error. However, it is hoped that they will serve to facilitate the isolation of the special features of Hansen's secular stagnation concept of trend.

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[2] George Terborgh even goes so far as to suggest that the TNEC Hearings on Savings and Investment were manipulated so as to provide support for the thesis and to defraud the public into believing it. *The Bogey of Economic Maturity*, Chicago, 1945, pp. 6–8. On this point see B. Higgins, "The Doctrine of Economic Maturity," *American Economic Review*, Vol. 36, March 1946, p. 135; and "To Save or Not to Save?" *Canadian Journal of Economics and Political Science*, February 1948.

[3] Cf. J. A. Schumpeter, "John Maynard Keynes: 1883–1946," *American Economic Review*, Vol. 36, September 1946, p. 516.

[4] *Vide*, e.g., his *Fiscal Policy and Business Cycles*, New York, 1941, pp. 309–11; his "Economic Progress and Declining Population Growth," *American Economic Review*, Vol. 29, March 1939; "Some Notes on Terborgh's 'The Bogey of Economic Maturity,'" *Review of Economic Statistics*, Vol. 28, February 1946, p. 13.

[5] A declining economy would be one in which both actual and potential gross national product are falling in real terms.

The classical concept of the stationary state, which for the classical school was an historical phase and not just an analytical model, was essentially a concept of a mature economy. In Adam Smith, the stationary state was even recognized to be one in which wealth might be very great, but nevertheless one in which "there would be a constant scarcity of employment." [6] In the stagnation theories of Ricardo and Mill, however, unemployment plays no significant role; stagnation in Ricardo's analysis referred to what Mill called gross annual produce, and what we would now call gross national product at full employment. The stagnation resulted from the natural tendency of profits to fall and the consequent choking off of capital accumulation. Ultimately, stagnation would result in a constant population, but capital accumulation might cease, in Ricardo's view, long before population reached its highest point.[7] In Mill's stationary state, there would be no increase in either population or stock of capital, profit having reached the minimum necessary to prevent net dissaving by the economy as a whole. However, there might still be a rising standard of living, due to improvements in the art of living and increased leisure through technological progress.[8]

[6] *Wealth of Nations*, Book 1, Chapter 8. The condition of labor, according to Smith, would be happiest in the progressive state—even if the state were not yet very wealthy; it would be "hard in the stationary, and miserable in the declining state."

[7] *Principles of Political Economy and Taxation*, especially Chapters 6 and 21.

[8] In the opinion of Mill, stagnation was just around the corner for England. "When a country has long possessed a large production, and a large net income to make savings from, and when, therefore, the means have long existed of making a great annual addition to capital, it is one of the characteristics of such a country, that the rate of profit is habitually within, as it were, a hand's breadth of the minimum, and the country therefore on the very verge of the stationary state." As for England, "the mere continuance of the present annual increase in capital, if no circumstance occurred to counteract its effect, would suffice in a small number of years to reduce the rate of net profit to (the minimum)." *Principles of Political Economy*, Book IV, Chapter 4.

The classical economists regarded economic development as a race between technological progress on the one hand, and diminishing returns to labor (population) on the other. The rate of capital accumulation affected the level of production, but capital accumulation was itself a dependent variable; it was a function of the rate of profit, and profits depended on the outcome of the race. Much the same was true of population in the classical system. So long as production increased sufficiently, population would grow; but as production reached stability, population would do likewise.

The ideas of Karl Marx about the trend of gross national product at full employment were not markedly dissimilar from those of the classical school. As a result of the tendency of profits to fall, capital accumulation in Marx's view is checked, and the rate of economic expansion declines. However, Marx added two new theories regarding the actual trend of production and employment in a capitalist society. First of all, the increasing ratio of fixed to circulating capital, the concentration of industry, and the tendency towards monopolization, would in themselves result in increasing excess capacity, and perhaps also in unemployment. Second—and on the whole more important in Marxian analysis—economic fluctuations of increasing intensity lead to a growing gap between potential and actual gross national product. Moreover, full employment may not be established even at the peak of the boom.[9] The general pattern, so far as the actual and potential trend of gross national product is concerned, is not greatly different, whether full employment is reached at the top of the boom or not. Employment cannot exceed full employment by very much or for very long, unless full employment is curiously defined. Consequently "increasing intensity of cycles" of *employment* means deeper and longer depressions. The resulting trend of gross national product, in the sense of average level over the cycle as a whole, must therefore fall further and further below the trend at full employment.

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[9] "The course characteristic of modern industry, viz. a decennial cycle (interrupted by smaller oscillations) of periods of average activity, production at high pressure, crisis and stagnation, depends on the constant formation, the greater or lesser absorption, and the re-formation of the industrial reserve army for surplus production." *Capital,* Volume II, Chapter 25.

I turn next to the long-run theories of J. M. Keynes. Keynes' theory of under-employment equilibrium also involves a stagnation concept. It implies that an economy may bump along the bottom of a cycle indefinitely, in the absence of appropriate government policy or other favorable outside shocks to the system. It also suggests that full employment is a rarity, even in the prosperous phase of cycles. Consequently, average gross national product over the cycle as a whole will fall considerably below the full employment level. In *The General Theory* there is no systematic presentation of the thesis that there is a tendency towards an *increasing* gap between actual and potential gross national product. However, Keynes does suggest that under-employment equilibrium is a phenomenon more typical of the twentieth century than of the nineteenth. His concept of full investment (zero net returns to new investment), his remarks concerning the "Day of Judgement," and his statement that twenty-five years of full employment in the United States or the United Kingdom might produce full investment in those countries, contain the kernel of a doctrine of economic maturity. Taking these fragments in conjunction with others, and with his *Eugenics Review* essay on population, it seems likely that Keynes did conceive of an increasing gap between actual output and full employment output as the economy became more mature.

Another long-run theory which has received much attention is that of J. A. Schumpeter. Although Schumpeter's theory has much in common with Keynes', there are also important differences. The Schumpeter model starts from equilibrium, with full, or at least optimum, employment. The basic cycle consists of an inflationary boom and recession, but secondary effects due to friction produce the depression and recovery phases of the real world. In Schumpeter's opinion, there are two major cycles, the Kondratieff of some fifty-five years, and the Juglar of about nine years, which is superimposed upon it.

The trend is drawn through the inflection points. For Schumpeter, there are at least three such trends. First, in the absence of innovations, population growth, or frictions, there would be a stationary flow, with income and employment at a constant long-run level. Second, with innovations, population growth, but no other frictions or government intervention, there would be a trend derived from two-phase cycles, consisting of an inflationary boom and a recession to the full employment level. I am not aware that Schumpeter ever stated his views as to what the trend of production capacity would be, but with a declining rate of population growth it would presumably resemble a normal growth curve, with a tendency for a decline in the rate of growth. Third, there is the actual trend, which is a product of innovations, population changes, frictions, and government policies. Schumpeter believes that this trend falls below the full employment level, stating that "Imperfections of both competition and equilibrium . . . may account for the presence of unemployed resources independently of the cyclical process of evolution." [10] While I am not sure that Schumpeter ever committed himself in so many words, it seems quite clear from his discussion in *Capitalism, Socialism, and Democracy*, in his essay in Professor Harris' volume on *Postwar Economic Problems*, and in his critique of the stagnation thesis in the final pages of his *Business Cycles*, that he believes the actual trend to be falling further and further below the trend at full employment. His reasons for this belief are, of course, different from Hansen's: the increasing degree of inflexibility in the system, the increasing hostility to a free-working capitalistic system, and the growth of policies that reflect this hostility.

Angell's view, at least regarding the stagnation of the thirties, are similar to Schumpeter's.[11] He contends that stagnation was due less to a secular decline in objective opportunities for private investment than to the lasting unfavorable effects upon entrepreneurial anticipations of the events of 1929–33, and of the disturbing New Deal policies that followed. He seems to feel that these factors produced a Kondratieff trough rather than a break in the longer-run secular trend, but he does believe that "even abstracting from the probable effects of the war and the defense program, the outlook for any very large, rapid, and sustained expansion of private economic activity in the United States over the next decade or more is not encouraging." [12]

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[10] *Business Cycles*, New York, 1939, Vol. 1, p. 161.

[11] James W. Angell, *Investment & Business Cycles*, McGraw-Hill Book Co., Inc., 1941, Ch. 13.

All the concepts of trend discussed thus far involve a kind of stagnation at some stage of economic development. Indeed, there would seem to be only one notable exception to this kind of conception of trend. Professor Hayek's theory of the trade cycle implies that economic fluctuations take place around a full-employment equilibrium position, perhaps with full employment defined so as to include a substantial amount of chronic and frictional unemployment. In this theory, booms are inflationary expansions beyond the equilibrium level of income and employment.[13]

The concern over inflation in the literature of the twenties and early thirties suggests that many economists formerly thought that booms really were of that character. The more naïve versions of this theory even imply that before 1929 prosperity was a more normal state of affairs than depression.[14] Yet if inflationary booms were really more common than deflationary depressions before 1929, the trend of prices ought to have been upward, especially if gold discoveries and development of fractional reserves led to an upward trend in the quantity of money adequate to offset long-run increases in productivity. There is no clear-cut statistical or historical evidence regarding the long-run trend of prices. The answer one gets depends largely on the year chosen for a base and on the indexes used, but, on the whole, prices in 1929 seem to have been somewhat lower than they were in 1790. In the whole period 1790–1929, only wars and their immediate repercussions seem to have succeeded in carrying the price level above normal, and the inflationary booms of war periods have been the result of an excess of government expenditures over tax revenues, rather than an excess of spontaneous private investment over planned savings.[15] The point is certainly one requiring further study; it is curious that no one has insisted that the critics of the stagnation thesis, who have been loud in their demands for empirical proof of that thesis, should provide statistical evidence that their own peculiar interpretation of historical trends is the correct one.

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[12] *Op. cit.*, p. 285. Reprinted by permission.

[13] It would appear that Hayek has not changed his fundamental position in this respect. In a recent article ("Full Employment Illusions," *The Commercial and Financial Chronicle*, July 18, 1946) he writes, "at the top of the boom, or even at the early stages of an incipient depression, there are practically no unused resources available which would make it possible substantially to increase the output of investment goods without drawing labor and other resources away from the production of consumers' goods." He also states "an attempt to cure this (chronic and frictional) unemployment by monetary expansion is bound to produce inflationary symptoms," and "a policy of merely maintaining purchasing power cannot cure unemployment." (Reprinted by permission.)

[14] Shields and Woodward, for example, state that "the general condition over the years was one of prosperity interrupted infrequently by these brief periods of adjustment." (*Prosperity, We Can Have It if We Want It,* New York, 1945, p. 112). See also Terborgh, *op. cit.*, Chapters 12 and 13.

II. HANSEN'S CONCEPT OF STAGNATION

The foregoing historical analysis indicates that the two distinctive features of Hansen's concept of stagnation are his explanation of it, and his dating of its appearance in the United States. He attributes stagnation to four sub-trends, which have been called the pillars of the thesis: the growth of personal and corporate saving, the declining rate of population growth, the disappearance of geographical frontiers, and the tendency for inventions to become capital-saving rather than capital-absorbing. He further argues that these factors are a twentieth-century phenomenon in the United States, and that their presence became apparent for the first time in the great depression.

It is not absolutely clear from Professor Hansen's own writings what he assumes to be the relationship between secular stagnation and the long waves of economic activity. The organization of

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[15] See, for example, the Cleveland Trust Company's chart of wholesale prices, reproduced in the *Hearings before a Subcommittee of the Committee on Banking and Currency*, U.S. Senate, on S. 380 (Full Employment Act of 1945), 79th Congress, 1st session, p. 22.

Chapter 1 of *Fiscal Policy and Business Cycles* ("major and minor cycles," "building cycles," "the so-called long waves," and "structural changes in the American economy," with the stagnation factors discussed under the last heading) certainly suggests that he regards stagnation as a phenomenon additional to observed cycles. Yet in a footnote of his "Notes on Terborgh's 'The Bogey of Economic Maturity,' " he states that "the term 'secular stagnation' . . . is not applicable alone to mature economies," and that it "is perhaps the best English rendition of Spiethoff's phrase '*Stockung-Spanne*,' " which suggests that he thought of stagnation as the trough of the long wave. However, the declining rate of population growth, disappearance of the frontier, etc., are obviously trend factors rather than cyclical factors, and it seems probable, on balance, that Hansen regards his own special doctrine of stagnation as a theory of trend.

Strictly speaking, there are in Hansen's concept, as in Schumpeter's, three trend curves: gross national product at full employment, the historical trend, and the historical trend as it would be under "a policy of mid-nineteenth-century laissez-faire." [16] The actual historical trend of the average level of gross national product over cycles as a whole is in no small measure the product of fiscal policy, especially during war and immediate postwar periods. There is good reason to suppose that the Hansen thesis refers to a growing gap between the gross national product at full employment and the trend that would exist under a policy of complete fiscal neutrality. Whether this latter curve would lie above or below the historical trend is not certain. Fiscal policy has tended in the past to accentuate both upswings and downswings.[17] Economic expansion over long periods, such as the period of railroad building, has usually been supported by government subsidies of one sort or another. Some booms, on the other hand, appear to have been prematurely checked by deflationary monetary and fiscal policy. On the whole, it seems likely that the trend would not have been much different under a completely laissez-faire fiscal policy, but this is one of the many questions surrounding the stagnation thesis that needs more thorough study.

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[16] Alvin Hansen, "Some Notes on Terborgh's 'The Bogey of Economic Maturity,' " *op. cit.*, p. 13. Reprinted by permission.

[17] Cf. my report on *Public Investment and Full Employment*, International Labour Office, Montreal, 1946, Part IV.

Hansen has said little about the trend of national income at full employment. His thesis would be quite compatible with an increasing, constant, or declining rate of growth of potential national income, provided the *gap* was present and growing. No doubt the implication in his discussion is that the rate of growth of potential, as well as actual, national income must eventually taper off, in the manner indicated in Figure V. Indeed, no other hypothesis is reasonable. Given declining population growth and disappearing frontiers, it would take an ever-increasing rate of technological progress to keep the growth of national income at full employment from slowing down; and population and known supplies of mineral sources cannot be increased at a constant (percentage) rate indefinitely, if only because of purely spatial limitations.[18]

The fact that the same factors influence both the trend of potential gross national product and the trend of actual gross national product is a point of considerable importance for the Hansen thesis, and one that Hansen himself failed to analyze. For it means that a growing gap between the two trends can be explained in terms of these factors only if it can be demonstrated that they influence the actual trend more than the potential trend. A trend towards a rising propensity to save, however, is one factor that would obviously affect the actual level of income more than the potential level. It would not affect the potential level at all, while it would be crucial for the level of gross national product actually attained with a given rate of private investment. This point is of vital importance, for it means that given a rising propensity to save, the Hansen thesis could be substantiated even if it were shown that all the factors on the investment side influenced the potential and actual levels of income equally. It is worth repeating, however, that it is not essential to the Hansen thesis for the growth of potential gross national product to have tapered off in the thirties.

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[18] For a discussion of physical and technological limits to a constant rate of growth of national product, see M. King Hubbert, "Economic Transition and Its Human Consequences," *Advanced Management*, July-September, 1941. Hubbert points out that for the percentage rate of increase in production from 1820 to 1910 (when the rate began to fall) to have been maintained, production in 1929 would have had to be 1.5 times its actual level, and in 1941 it would have had to be double its actual level (p. 100); and he concludes "that any such exponential expansion . . . is a distinctly temporary state of affairs and that this phase must be followed by a long-time period of levelling off or decline." (p. 99)

Some of the less sophisticated criticisms of the thesis seem to have been based on a confusion of the two trends. The stagnation thesis seemed to some to cast aspersions on American productive genius and the American spirit of enterprise.[19] No such aspersions are implied. The pattern Hansen had in mind was probably a generally rising trend of potential output as a result of technological improvements and improvements in business methods. If full employment were maintained and potential production were realized, therefore, the standard of living (output per capita) could continue to improve indefinitely.[20]

Two final possible patterns, also consistent with the Hansen thesis, should be mentioned. First, the potential trend need not always have been above the actual trend; there may have been periods—say during the price revolution of the sixteenth century when inflationary booms were the rule rather than the exception—yielding a level of demand above the full employment level. Finally, the gap need not go on growing forever. With population actually declining, it is conceivable that the potential trend might fall while the actual trend continued to rise until the gap was finally closed. It should also be noted that prediction of a deflationary gap for some year or years in the future does not imply, as Terborgh suggests it does, acceptance of the Hansen thesis. It does not involve a conviction that the gap is growing or even continuing, and it does not involve an explanation of the gap in terms of Hansen's four factors.

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[19] Swanson and Schmidt seem to fall into this category. Cf. their *Economic Stagnation or Progress*, New York, 1946, Chapter IV, and B. Higgins, "To Save or Not to Save?" *loc. cit.*

[20] Hansen has stated that "the bulk of my writing has been devoted to an analysis of economic policies which would give us an expanding economy and full employment. The question really is: Would a policy of mid-nineteenth-century laissez-faire, now, give us that degree of expansion and full employment which we experienced in that century?" ("Some Notes on Terborgh's 'The Bogey of Economic Maturity,'" *op. cit.* Reprinted by permission.)

III. EMPIRICAL TESTS OF THE STAGNATION THESIS

There have been a number of attempts to subject Hansen's thesis regarding secular trends to empirical tests.[21] These tests have been inconclusive, largely because they have not been carefully designed. In some cases, they have failed to yield useful results because they are based upon an erroneous conception of the thesis itself.[22] No attempt will be made to present empirical proof here, but an effort will be made, instead, to suggest the kind of empirical study that might provide such proof.

Assuming that the Kuznets data are reasonably accurate, it is quite a simple matter to test the actual trend of gross national product. Some question might arise as to whether the data indicate a gradual tapering off of expansion, or a break in an otherwise growing trend. Logically, the former hypothesis seems more reasonable, but the latter ought to be subjected to analytical tests. Given reasonably good figures on the size of the labor force, it would be possible to make estimates of what the trend of gross national product would have been with full employment over the period covered by the Kuznets data. A comparison of the two curves would then show whether or not the gap between them is increasing. In making such a comparison, however, it would be necessary to begin and end the trend curves at the same stage of the Kondratieff cycle. Otherwise the gap might indicate, not a long-run trend, but the phase of the Kondratieff during the last years covered by the analysis.

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[21] Among the better known of such attempts are: G. Terborgh, *The Bogey of Economic Maturity*, *op. cit.;* M. V. Jones, "Secular Trends and Idle Resources," *The Journal of Business of the University of Chicago*, October, 1944, Part 2; W. Fellner, *Monetary Policy and Full Employment*, Berkeley, 1946, Part II.

[22] This statement applies to much of Terborgh's book, for example. Cf. B. Higgins, "The Doctrine of Economic Maturity," *op. cit.*

A more direct approach, given adequate data, would be merely to test the long-run trend of average annual unemployment over the Kondratieff cycle as a whole. An increasing trend of average annual unemployment would itself constitute empirical proof of a growing long-run deflationary gap.

One of the difficulties with such tests is that the actual trend is considerably influenced by government policy, especially since 1913. Consequently, the trend does not show what would have happened if private enterprise had been left to its own devices. Budgets, for example, have seldom been balanced. One might be tempted to argue that a stable trend in national debt combined with a rising trend of unemployment would be proof enough of a growing deflationary gap. However, there is no assurance that the inflationary effects of a deficit are just equal to the deflationary effects of a surplus of equal size. In other words the discouraging effects of high taxes on private investment may be more important than the stimulating effects of low taxes, even though the budget for the entire period as a whole is exactly balanced. The income group affected by tax increases or cuts may be different from the one affected by expansion or contraction of spending. There is probably no way of discovering empirically what the trend of gross national product would have been under a neutral government policy. There may be no way of finding out analytically either; both Hansen's and Schumpeter's arguments regarding the effects of public policy on private investment are analytically plausible.

The discovery of a growing gap—and the present writer finds it hard to believe *a priori* that such a trend would not appear—would not, of course, constitute a proof of the Hansen thesis, as distinct from the Marx, Keynes, Schumpeter, or other theories of secular stagnation. In order to distinguish, empirically, between these concepts of stagnation, it is necessary to test the causes of stagnation as outlined by Hansen. In doing so, each of the four pillars of the Hansen concept must be formulated in such a manner that it can be tested empirically.

The Rising Propensity to Save

With regard to the savings side of the argument, it is necessary to decide first of all whether the discussion relates to the *volume* of savings, the savings *function*, or to the average *propensity* to save. Hansen himself has pointed to the downward historical drift of the savings function; the stagnation thesis obviously does not rest on any tendency for the savings function to rise. A rising trend of total savings, with a constant or falling average propensity to save, requires only a rising trend of total offsets to saving, while a rising trend of the average propensity to save requires a rising trend of the ratio of offsets-to-savings to national income. While the discussion has not been clear at all points, it appears that what Hansen had in mind was the average propensity to save rather than the volume of savings.

The savings relevant to the Hansen thesis are, of course, *ex ante* savings, and attempts to test the validity of this part of the thesis by measuring *ex post* savings, which are necessarily equal to investment, are therefore irrelevant. While *ex ante* or intended savings are difficult to measure, an approach to their volume might be made through figures of income and employment. With balanced trade and balanced budgets, an excess of *ex ante* savings over *ex ante* investment appears as a decline in income. Failure of income to rise enough to attain full employment in an upswing indicates an excess of *ex ante* savings relative to *ex ante* investment at high levels of employment. *Ex ante* investment will differ from *ex post* investment only by unplanned changes in inventories, which could be taken into account. Thus, if a rising trend of *ex post* investment, adjusted for any trend in unplanned inventory changes that may appear, is accompanied by a rising trend of unemployment, it is reasonable to conclude that the trend of *ex ante* savings is rising still faster.

Separating planned from unplanned inventory accumulation so as to isolate any trend in the latter would obviously be no simple task. Studies of the inventory cycle should help, however, to make such separation possible. Generally speaking, increases in inventories during periods of falling consumption and prices can be regarded as unplanned, but some adjustment might be necessary when a drop in consumption followed a rise, since in that case part of the increased investment in inventories during the initial stages of the drop in consumption would presumably represent planned investment based upon an erroneous projection of past levels and changes in consumer spending.[23] One might be inclined to argue that any trend in unplanned investment is unlikely to be significant in magnitude, and that drops in national income, or failure of income to rise to the full employment level, demonstrate a tendency for *ex ante* savings to exceed *ex post* savings at high levels of income, rather than an unfavorable reaction to a tendency for *ex post* investment to exceed *ex ante* investment at high levels of employment. However, there is no clear-cut evidence that such is the case, and there is some evidence that planned savings are adjusted rather quickly to changes in income. Moreover, growing magnitude and amplitude of inventory cycles might in itself bring a growing gap between planned and actual investment over the cycle as a whole.

Professor Hansen stresses the growth of corporate self-financing and of institutionalized personal saving (such as insurance) as factors in the increasing propensity to save. Perhaps even more important than these is the rise of per capita income which economic development has made possible. Indeed, while it seems clear that corporate savings, insurance premiums, and other institutional saving have been swelling in volume in recent decades, it is no simple matter to demonstrate from these facts a rising trend of the average propensity to save. It would be necessary to show not only that corporate surpluses and reserves and insurance premiums are a rising percentage of national income, but that the percentage of income saved is greater than it would be if corporations distributed all their earnings and relied on the capital market for funds, and if people provided their own reserves for contingencies. There is no clear-cut proof that shareholders are less likely to save their dividends than are boards of directors; and without the institution of insurance, people might well save more to meet such contingencies as fire, theft, and death than they now put into insurance.

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[23] *Vide* L. A. Metzler, "Three Lags in the Circular Flow of Income," p. 11 in this volume.

Declining Rate of Population Growth

Least difficult to test of the four main pillars of the Hansen thesis is the argument concerning the effect of the declining rate of population growth upon investment. For one thing, the main facts are beyond dispute. The percentage increase in the American population began to fall about 1850, although it did not fall much until the 1920's, and the absolute increase began to fall about 1925. For another, population growth is a secular trend if any economic quantum is. And finally, no one has really denied that other things being equal, a rapidly growing population will call forth more investment than a slowly growing one.

There are two main ways in which population growth affects investment. First, a growing population provides a growing labor force. So long as population growth keeps pace with capital accumulation, the marginal productivity of capital will, in the absence of other influences, remain constant. But when population growth falls off, capital accumulation must also fall off, if, apart from other influences, the marginal productivity of capital is not to decline. Second, a growing population provides an increasing demand for goods and services. The correlation between long-run increases of population and of consumption is so high that one can be more or less substituted for the other, and consequently the "acceleration principle" argument, which states that a mere drop in the rate of increase in consumption may cause an absolute decline in investment, can be applied with minor modifications to population.[24] In addition, of course, a declining rate of population growth involves changes in the composition of population that may be of great importance.

The early discussion of population growth and investment failed to distinguish adequately between percentage and absolute rates of growth, and while this confusion has now been largely eliminated,[25] there is still insufficient clarification as to which is more important and as to which is relevant to what arguments. Speaking generally, the absolute rate of growth is the more important concept, and a falling percentage rate of increase is significant mainly as a harbinger of a later drop in the absolute increase. So far as population as a source of labor is concerned, the percentage rate of increase is important only if it is necessary to maintain a certain percentage increase in quantity of capital in order to offset a given percentage increase in the volume of savings. However, this situation would be the real one to the extent that the volume of business saving in any year tended to equal a certain percentage of existing plant and equipment, and therefore to rise at a cumulative rate.[26] For that part of the argument based upon the acceleration principle, the absolute rate of increase is clearly more important.

Fellner endeavors to test the population aspect of the Hansen thesis by examining the relationship of population growth to the consumption function.[27] This approach is unsatisfactory on several counts. First, the Hansen argument regarding population growth is not dependent upon upward shifts of the consumption function—although, of course, any tendency for the propensity to consume to rise with population would strengthen Hansen's argument. Second, there is the usual difficulty in historicostatistical analysis that the historical relationship between income and consumption is the product of many factors, of which population growth is only one. Third, the apparent stability of the marginal propensity to consume over the long run does not preclude the possibility that the historical relationship is the product of upward shifts in the function. Finally, for most periods, the over-all, historical consumption function shows absolute increases in income greater than the absolute increases in consumption. That is, when consumption was increasing, investment also grew, and the growth of population may have been responsible for the growth of investment, without which the whole historical consumption function would have been different. Indeed, Fellner's Figure 16, based on the Kuznets data, shows a very close relation between population growth and capital formation. If the abnormal period of the first world war is left out, the scatter can be well fitted by a very steep curve that is convex downwards, suggesting that investment rises more than proportionately to population. The curve is so steep, however, as to suggest that factors other than population growth were dominant in the expansion of investment.[28]

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[24] *Vide* E. D. Domar, "Competition, Monopoly, and Private Investment," elsewhere in this volume.

[25] *Vide* Hans A. Adler, "Absolute or Relative Rate of Decline in Population Growth?" *Quarterly Journal of Economics*, August, 1945; and Alvin Hansen, "Some Notes on Terborgh, etc.," *op. cit.*, pp. 13–15.

[26] *Vide* E. D. Domar, "Expansion and Employment," *American Economic Review*, Vol. 47, March, 1947.

[27] *Monetary Policy and Full Employment*, *op. cit.*, Part II.

Capital-Saving Innovations

The third argument in support of the stagnation thesis is that inventions have increasingly become capital-saving rather than capital-absorbing. This tendency has usually been tested by comparing the growth of capital formation with the growth of production of final products. The Kuznets data of 10-year averages, with a 5-year overlap to reduce the effects of cycles, show a rising trend in the ratio of output of capital goods to output of final products from 1869–78 to 1914–23, followed by a sharp drop for the decades 1919–28, 1924–33, and 1929–38. However, these data do not constitute a substantiation of the Hansen thesis. In the first place, they may not show a reversal of trend; they may merely indicate a Kondratieff downswing. In the second place, they do not, in themselves, demonstrate that inventions are becoming increasingly capital-saving.

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[28] The irrelevance of the empirical tests applied by Terborgh to the population aspect of the Hansen thesis has already been pointed out. Cf. Alvin H. Hansen, "Some Notes on Terborgh's 'The Bogey of Economic Maturity,'" *op. cit.*, and B. Higgins, "The Doctrine of Economic Maturity," *op cit.*

There can be little doubt that many of the significant inventions of recent years have been capital-saving, in the sense that output per dollar of investment is greater with the newer techniques than with the older ones. Indeed, it is hard to believe that inventions have not always been capital-saving in the technical sense. The ton-miles of freight carried per dollar of investment must surely be greater for a steamship or steam train than for a sailing ship or stage coach. What matters, however, is not whether inventions are labor-saving or capital-saving or both, once they are in place, but whether the process of installing them absorbs or releases capital on balance. This part of the discussion of Hansen's thesis would therefore gain from a shift of attention from capital-saving *inventions* to capital-saving *innovations.* The introduction of a new commodity or new technique may result in net absorption of capital, whether the invention itself is capital-saving or not, in one of three ways:

1. It may give rise to an expectation of windfall profits arising from a temporary monopoly position for the first firms in the new field, to a wave of "followers" when the success of the venture has been demonstrated, and to further innovations in related industries, according to the well-known Schumpeter model. The "great new industry" innovations seem to have been of this type.

2. Even with pure competition existing and expected to continue, an innovation, by accelerating the rate of replacement through obsolescence, may result in a temporary increase in the rate of capital absorption.

3. An innovation may provide a new product so attractive that the propensity to consume is raised. This kind of expansionary effect of innovation has received less attention than it deserves.

It seems probable that the development of the automobile, and the accompanying development of consumers' credit, had this kind of effect.

There is no *a priori* reason, and little empirical evidence, to support the thesis that a new trend for innovations to be capital-saving has made its appearance in recent decades. However, as any country adds to its stock of plant and equipment, it tends to accumulate replacement funds at a rate roughly proportional to the value of the stock of capital, or even at an increasing rate if the rate of obsolescence increases. While these funds are normally used for replacing worn-out equipment and consequently represent a demand for investment goods, if capital-saving inventions are continuously being introduced the replacement funds may be more than adequate to replace worn-out capacity with more modern machines. If this is true, the replacement process will have a net deflationary effect. If this deflationary effect is to be avoided, *new* investment must rise at an increasing rate. The more highly developed a country is, the more difficult it is to add to capital at a rate even faster than in the past. In this connection, the "trend" regarding innovations is extremely important. The investment generated by any one innovation increases at an increasing rate over a certain range, tapers off and finally declines. In order to have a rising trend of net additions to capital, therefore, each successive innovation (or group of innovations) must be *more* capital-absorbing than the last. This is rather a tall order. Having once had a railway age, it became almost impossible to develop innovations—or groups of innovations—even more capital-absorbing than railways and contemporaneous innovations were. The real truth of the "capital-savings inventions" argument may be simply that in recent decades innovations have not been sufficiently capital-absorbing to maintain the rate of increase in additions to capital of earlier decades. There seems to be no simple way of finding out whether or not such is the case. Figures are available only for *ex post* investment, which is the product of the whole nexus of economic forces.

The Disappearance of the Frontier

Having considered three of the arguments upon which the stagnation thesis is based, I turn now to the fourth and last argument concerning the disappearance of the frontier. In support of the stagnation thesis, it has been said that the presence of undeveloped land and other national resources in the United States offered extraordinary opportunities for investment, and that the disappearance of our frontier is therefore likely to retard the rate of capital accumulation. In order to test empirically whether the frontier "has disappeared" or "is disappearing," or when it "started to disappear," it is necessary to have a more precise, objective definition of geographic frontier than Hansen's "discovery and development of new territory and new resources." [29] Moreover, in order to determine what contribution the existence of a geographic frontier makes to a high level of investment, it is necessary to distinguish the opening of a frontier from the growth of population and from innovations.

When is a territory "new"? When it is entirely unpopulated, or when population per square mile is below a certain figure, or when production techniques lag behind other countries, or when its natural resources are as yet unknown? The mere presence of unoccupied territory, i.e., land upon which no one is employed, clearly does not constitute a frontier in the economic sense, if it is worth no one's while to employ someone to do something with it or on it.[30] Yet growth of population in one part of a country may at some stage make it worth while to exploit previously unoccupied territory. Similarly, an innovation may make some previously worthless resource highly useful—witness atomic energy and known but untouched uranium deposits—and so make it worth while to move people into a region formerly unoccupied.

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[29] Alvin H. Hansen, "Some Notes on Terborgh," *op. cit.*, p. 13.

[30] An alternative definition of unoccupied territory would be land for which no legal ownership has been established; but for economic analysis this definition seems less convenient, and Hansen himself has rejected it. (Terborgh's *The Bogey*, etc., *op. cit.*, p. 15.)

A reduction in transportation costs, or cheaper power, may also result in development of known resources formerly left idle. Development of new territory is clearly one of the incidental effects of population growth and of some kinds of innovation. A shift in demand may also open up new territory.

Many tenable concepts of the frontier suggest themselves, but it seems most useful to define a *geographic* frontier as an area within which there are increasing returns to both labor and capital with existing technical knowledge, population, and tastes. An area within which increasing returns would appear only with a change in techniques, population, or tastes might be called an *economic* frontier. Thus, economic frontiers become geographic frontiers as a result of dynamic changes. The frontier might be said to have disappeared when the point of diminishing *average* returns to labor and/or capital has been reached, and might be said to begin disappearing when the point of diminishing *marginal* returns to labor and/or capital has been reached.

As used in the Hansen thesis, however, the concept of frontier is a relative one. The existence of a new area into which labor and capital are being moved implies the existence of an old area from which labor and capital come, and the opening up of a frontier thus involves movement of labor and capital. Increasing returns to labor and capital is a necessary, but not a sufficient, condition for an area to be a geographic frontier; in the nineteenth century, England as well as America would have fulfilled this condition, and it seems highly doubtful whether any useful purpose would be served by regarding the former as a frontier area. For a region to constitute a geographic frontier, therefore, one of the following additional conditions must be present as well: (1) It may be an area where the most advanced *known* techniques are not utilized. (2) It may be an area where the marginal productivity of labor and/or capital is higher than in other countries, because the ratio of labor and/or capital to natural resources is lower than in other countries. (3) A frontier might be said to exist if migration of labor and capital into a new area will raise the marginal productivity of labor and capital in the mature economy, without raising it above the level in the new territory. Apart from these three conditions, a less tangible factor, which may nevertheless play some role, is frontier psychology. In economic terms, this factor would consist of a relatively low level of liquidity- and safety-preference, or a relatively high marginal efficiency of capital, for any given set of objective conditions.

These conditions make it possible to distinguish the development of a frontier from mere migration of industry. If investment of labor and capital in the new area is accompanied by a decline in the amount of labor and capital utilized in the old area (either in a particular field or in the whole economy of the area), there has been a migration of industry. Migration of industry may nevertheless result in temporary increase in *current* investment in the old and new areas combined, because the fixed plant of the old area cannot be moved to the new one. When the movement into a new area results in a rise in the amount of labor and capital utilized in the old area, on the other hand, the increment constitutes the development of a frontier. Thus the opening of a frontier results in an increase in investment in the new-and-old economies combined.

From these remarks, it should be apparent that the importance of the frontier for investment problems cannot be judged by simple comparisons of the rate of investment in different regions, or by comparisons of the same region at different periods of time. On the contrary, the problem of when the American frontier began to disappear, and/or the effects of this disappearance upon outlets for private investment, may be answered only by an exhaustive historical and statistical analysis.

IV. ADDITIVE EFFECTS OF THE FOUR FACTORS

There are good reasons for supposing that the effects of the four factors taken together will be considerably greater than the sum of the effects of each taken by itself, and much of the force of the Hansen thesis derives from the contention that the four factors have coincided historically. One of the most obvious of such combined effects arises in connection with the argument concerning the production function. Returns to capital will tend to diminish more rapidly if both the supply of labor (population growth) and the supply of natural resources (opening and development of frontiers) fail to keep pace with capital accumulation, than they would if either labor supply or available material resources increased with the supply of capital. It is also obvious that the dwindling of investment opportunities in general will be more serious if the *ex ante* average propensity to save is rising than if it is falling. Similarly, a rapidly growing population will tend to enhance the expansionary effects of technological progress by virtually guaranteeing a net increase in demand for the product if a new technique is introduced; and conversely, technological progress of the sort that raises the propensity to consume will help to offset any long-run tendency towards a rising average propensity to save, and will help to avoid adverse effects of a declining rate of population growth.

It also seems clear that there is a mutual interdependence between the rate of population growth in the old territory and the rate of investment in the frontier area, and so, through secondary repercussions, in the old territory as well. Up to some point, an increasing rate of population growth in the old area will tend to raise total and per capita income there by calling forth a high level of investment. After some point is reached, however, the increase in sheer numbers will give rise to an actual or prospective decline in per capita income, leading to emigration and a rise in investment in new areas. The decline in population pressure in the old area, and new opportunities for investment in the old area provided by development of the frontier, will, however, tend to raise per capita income at home at some point. Thus the rate of emigration and of investment in the frontier will tend to taper off at some level of population growth at home. This analysis suggests the need for developing a concept of the optimum rate of population growth, which would bear a relationship to the optimum propensity to consume and to various other factors.

Such inter-relationships mean that the Hansen thesis cannot be adequately tested by isolating the effects of each of the pillars by itself. Some means must be found of taking account of inter-relationships among the various trends involved. Empirical studies of a highly complicated order seem to be called for.

V. CONCLUSION

The questions raised by Professor Hansen's doctrine of secular stagnation are enormously important for economic analysis and policy. To a very considerable extent, the ground covered by these questions is unknown territory. This essay does little more than provide a basis for preliminary discussion at the conceptual level, and to indicate the difficulties of designing statistical experiments that will yield conclusive results. Final answers to these pressing questions can come only from prolonged analytical, historical, and statistical research covering many countries, regions, and periods. Such research cannot be completed by one man in his own lifetime. It will require cooperative effort of a group of economists, and quite possibly of historians, sociologists, geographers, political scientists, and perhaps natural scientists as well. Any research foundation with "excess savings" could find no better outlet for investment of its idle funds than such a broad, long-range study of secular trends.

V

Secular and Cyclical Aspects of the Multiplier and the Accelerator

BY

RICHARD M. GOODWIN

I. INTRODUCTION

IN THIS essay, I propose to consider how satisfactorily it is possible to explain the central characteristics of the development of the American economy by two theories closely associated with Professor Hansen's work. In particular, I shall attempt a somewhat closer union between secular and cyclical behavior than is usually achieved. This has also been an outstanding feature of his contributions. Both the multiplier and the accelerator are, properly understood, dynamic, and hence might conceivably explain the evolution, as distinguished from the state, of capitalism. Both are simplified and rigorous statements of rather obvious economic characteristics of modern capitalism, and for that reason command wide acceptance.

In his controversy with Professors Hansen and Clark, Professor Frisch pointed out that the accelerator did not necessarily imply a breakdown in capitalist expansion, but that a steady growth at a constant percentage rate would be possible.[1] He pointed out also that the accelerator alone does not constitute a closed system, in the sense that by itself it does not determine the behavior of consumption and income. The invention of the multiplier, however, provided a link which can close the system and determine completely its development. In *The Trade Cycle* R. F. Harrod based his theory on a combination of the two principles, but, as Professor Tinbergen points out in his review, in their simplest form at least, they cannot explain the existence of cycles.[2]

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[1] "The Interrelation Between Capital Production and Consumer-taking," *Journal of Political Economy*, October, 1931, and subsequent issues.

This is easily perceived by stating the two concepts in mathematical form. If we call consumption c, income y, the marginal propensity to consume α, capital stock k, investment i (or $\dot{k}$, since it is the rate of change of capital stock), the acceleration coefficient κ, and constants H and J, then we may represent the combination of the two by the following equations:

$$(1)\ c = \alpha y + H;$$
$$(2)\ k = \kappa y + J;$$
$$(3)\ y = i + c.$$

As is customary, we must assume all these to be in real terms. Combining (1) and (3),

$$y = \frac{1}{1 - \alpha} H + \frac{1}{1 - \alpha} i.$$

Thus we get the multiplier value of any income-generating expenditure, and of the constant in the consumption function (which might be considered income-generating in the sense that it does not depend on the level of income). If this expenditure consists solely of induced investment, then

$$i = \dot{k} = \kappa \dot{y}$$

and we find that if all savings out of income are to be readily absorbed into investment, and no difficulties are to appear, the rate of growth of income must be proportional to its level. Therefore, income must always flow faster and faster, to be exact, exponentially, the complete solution being

$$(4)\ y = Ye^{\left(\frac{1-\alpha}{\kappa}\right)t} + \frac{H}{1 - \alpha}$$

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[2] *Weltwirtschaftliches Archiv*, 1937, I, pp. 89 *et seq.* of the Schrifttum.

where Y is an arbitrary constant to be determined from initial conditions.[3]

In Kuznets' work on the secular growth of income, decade by decade from 1879, we have data which can be used to check against this theory.[4] We find that income has in fact maintained a good approximation to an exponential growth, with a rate of growth of about 3.8 per cent compounded continuously.[5] Furthermore consumption has been a remarkable constant proportion of income, staying close to 88 per cent. This necessarily implies, what has indeed been the case, that the sum of the unconsumed parts of income, or capital stock, will be a linear function of income. The average of the marginal values of κ is 3.4 and of α is .86. These values substituted into equation (4) require a rate of growth of 4.1 per cent, so that at first blush we seem to have at once an explanation of capitalist development, and a guarantee of its smooth progress, the achievable rate of growth being just sufficient to absorb the resulting savings.

Further consideration lends doubt to this reassuring conclusion. Actual performance will, of course, result in only such savings being generated as can be absorbed, but the structure of capitalism is not such as to permit expansion to proceed steadily. This fact naturally disappears if we sum over a decade, as this period is almost equal to the average length of the business cycle. The other evidence on the consumption function does not agree with these secular data, which make H approximately zero and α about .86. If we look within a cycle we find a very different result. Professor Samuelson's analysis of the Kuznets annual data for the period after the first world war gives $\alpha = .54$ and $H = 27.5$.[6] Budget statistics likewise would indicate a weaker propensity to consume.

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[3] Cf. E. D. Domar, "Expansion and Employment," *American Economic Review*, Vol. 37, March, 1947, pp. 34 ff.

[4] Cf. his essay in the University of Pennsylvania Bicentennial publication, "Studies in Economics and Industrial Relations."

[5] In these figures I shall give only approximations to show orders of magnitude. In every case the decade 1929–38 is omitted because of its obvious abnormality. Later I shall suggest a justification of this procedure.

[6] Cf. A. H. Hansen, *Fiscal Policy and Business Cycles*, New York, 1941, appendix to Chapter 11. This means lumping business with other savings. Who makes the decisions is of no matter, so long as they follow a consistent and fairly stable pattern.

Similarly κ is assigned too high a value by the crude secular figures, because they lump together autonomous and induced investment. There is no doubt that much investment was undertaken in the period since 1879 solely because of changes in the techniques of production. This must be distinguished from the investment resulting from increased output with old techniques, which is all that is involved in the accelerator. The latter is the only systematic or automatic demand for funds. The former type of investment cannot always be relied on to absorb savings; it is historically determined, the upward bursts of the economy awaiting the propitious moment, in a manner which has been analysed by both Professor Schumpeter and Professor Hansen. To assign an independent value to κ is difficult, because the statistics tell a confusing and contradictory story. Professor Tinbergen's studies, where the result was favorable to the acceleration principle, lead to a value of about one-half of what the pure theory would suggest.[7] Therefore we might consider a value in the neighborhood of 1.5 as reasonable.

If the economy is actually characterized by an α of .60 and a κ of 1.5, then income must grow at a rate of 27 per cent, in order automatically to ensure a use for the savings generated. This is obviously impossible, and therefore a hitch in the expansion will occur, barring vigorous and continued autonomous investment. Any autonomous investment will, of course, lessen the necessary rate of growth. The error in the original calculation should now be clear. Constants determined from the secular data naturally will produce a result in agreement with those data, but only, it should be added, if the assumed mechanism is of a type capable of explaining the facts. The qualitative agreement between the facts and such simple hypotheses is impressive.

Analytical difficulties remain, however. What is the mechanism of capitalist breakdown? Why, in its relapse, does it ordinarily not fall to its previous low? What explains the tendency, weak but persistent, to some regularity in the timing of these spurts? And how are we to explain a fairly consistent secular α and κ which sharply disagree with the true, or at least short-run, α and κ? To reconcile the secular and cyclical facts, it is plainly necessary to make further hypotheses, but these will remain simple elaborations of the multiplier and the accelerator.[8]

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[7] "Statistical Evidence on the Acceleration Principle," *Economica*, Vol. 5 (new series), May, 1938, p. 175. It should be noted that κ has the dimensions of time, and hence its magnitude depends on the unit of time used. I shall use units of one year throughout.

Because of the involved character of the subsequent argument, it may be helpful to summarize it here. If there are lags involved in the flow of payments as required by the multiplier and by the accelerator, a combination of the two can produce a cycle of the type of the major business cycle. If such a cycle existed, and were uniform and without trend, then consumption would be less than income half of the time and more than it the other half. Consequently if we lump a whole cycle together consumption would equal income, giving a marginal and average propensity to consume of one, even though the true marginal propensity were less than one. On the other hand if there were an upward trend, the good years would be more frequent than the bad and we would find consumption to be less than income. In this case the decade by decade figures would not provide the clue to the determinants of consumption, but would rather reflect the secular rate of progress achieved by capitalism in spite of its recurrent tendency to falter.

II. THE DYNAMIC MULTIPLIER

The multiplier, as implied by equations (1) and (3), assumes that all the "multiplying" is done instantaneously. It is difficult to see how this makes any sense. Money spent has no mystical virtue by which it stretches itself in the spending. As it circulates through the economy, it gradually produces further incomes, but only over a period of time. The original Kahn formulation was in terms of an infinite series, and the completion of this series takes time. In fact, it is never quite completed. However, at a certain point, it will be substantially complete, the lower the value of the multiplier, the shorter being the lapse of time required. The instantaneous multiplier gives the limit which income approaches in infinite time.[9] This multiplier takes an inadmissible jump to a conclusion, rolling up all the steps into one, and implying some sort of infinite velocity of income generation.

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[8] While I cannot undertake a defense of model making here, I should like to mention that it is not a valid criticism of a model to say that it is too simple. It cannot, and does not, aim to represent the complexities of actuality. The important, and much more difficult, question is whether or not the most essential things have been included, and whether or not these are verifiable empirically. One particularly crude simplification should be noted here, since it will be used without apology throughout. All functional relationships will be assumed to be linear. Otherwise in most cases a mathematical, and *a fortiori* a verbal, analysis

Usually, the dynamic element is introduced by virtue of the lapse of time between the discrete steps of the geometric progression which constitute the multiplier. But when one attempts realistically to identify the moments at which these steps occur, or the time intervals between them, the concept seems to evaporate. Economic life is extraordinarily continuous, characterized by a getting and spending which does not even cease at night. Furthermore, any reasonable time interval between the steps would have to be so short, that any process would have a rather brief duration. That real discontinuities exist, cannot be denied: the only question is whether or not these are large enough to be significant for macro-dynamic analysis.[10]

An analogy may illustrate, even if it cannot prove, the desirability of treating economic life as continuous.[11] In the eighteenth century, many scientific problems were dealt with by means of equations of finite differences. This was gradually replaced in the

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of this type of problem is impossible. One can only hope that, within the range of activity, the actual relationships are good enough approximations to straight lines.

[9] This was first formally proven by Professor Samuelson in his paper, "A Fundamental Multiplier Identity," *Econometrica*, Vol. 11, July-October, 1943, pp. 221–226. If α is greater than one, the series is not summable, and hence the instantaneous multiplier ceases to exist, but the dynamic multiplier implies simply a more rapid rate of increase and one which does not approach a limit.

[10] See L. A. Metzler, "Three Lags in the Circular Flow of Income," published in this volume, Chapter I, *passim.*

[11] On this point I am much indebted to Dr. P. LeCorbeiller.

nineteenth century by a parallel elaboration of the idea of a continuum, in both mathematics and the physical sciences. In the same period, overwhelming evidence accumulated to the effect that in nature there were discrete ultimate particles, e.g. atoms, electrons, etc. Nevertheless, it remains true today that no central theory in physical science is stated in terms of difference equations. This is feasible in electricity, for instance, because the quantities of interest in practical problems are large by comparison with the elementary particles. Surely the same holds true for aggregative economics. To the degree of fineness which we care about, our variables are continuous in time. We may keep the difference analysis of the multiplier, but interpret the differences as lags, and not as discrete jumps in time. This, however, increases the difficulties of analysis considerably. In any case, for a continuous process, it might be better to state the problem in terms of derivatives instead of differences. It is this possibility which I wish to explore.

The multiplier is a particular and simplified way of stating the process of the propagation of income. Two fundamental questions are involved: the limit toward which the effects of an impulse tend, and the rapidity with which this limit is approached. I propose to postulate a mechanism which will yield the usual multiplier value as a limit. The second issue, which has never been adequately settled, may be tackled by recalling that the Keynesian theory did not question the constancy of the velocity of *active* money.[12] In fact, the theory strengthened the case for a belief in constancy (a belief founded on good *a priori* reasoning, as well as some empirical material) by showing how and why observed velocity might deviate from it. In the multiplier analysis we are dealing only with active money. A constant income velocity of active money necessarily implies a certain constant average rapidity of circulation of an impulse through the economy.

Let us call ϵ the average time between one receipt of income and the next receipt of income which results from whatever is spent out of the first. This lapse of time is made up of two elements, the time between receipt of income and its spending, and the time between its spending and the receipt of new income resulting from that spending. The former I assume to be negligible.

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[12] "Nevertheless, if we have a short period of time in view, and can safely assume no material change in any of these institutional factors, we can treat V as nearly enough constant." *The General Theory*, Harcourt, Brace, 1936, p. 201.

As an hypothesis, let us consider the mechanism defined by

$$(5)\quad \epsilon\dot{y} + (1 - \alpha)y = i + H$$

Equation (5) corresponds to a combination of (1) and (3). The left-hand side gives the propagation, and the other side the spending input. The term i may be broadly defined as business investment or disinvestment (if negative), government deficit or surplus, and consumer spending not determined by the level of income, including the purchase of durable goods in accordance with the acceleration principle. All of this spending may be called investment, and it is to be understood in this broad sense.

As soon as the instantaneous multiplier is dropped, the supply of savings is not necessarily equal to the rate of investment. Inspection of equation (5) shows that only for a stationary income ($\dot{y} = 0$) is saving ($\{1 - \alpha\}y - H$) equal to investment. A stationary income is one for which the instantaneous multiplier would be valid. Any excess or deficiency of investment over saving must be financed by the creation of new active money, m_1. This money may be newly created or newly activated from hoards. The new active money is net, for some people may be hoarding while others are dishoarding or borrowing from banks.[13] Setting the rate of activation of money equal to the difference between saving and investment, we get

$$(6)\quad \dot{m}_1 = \epsilon\dot{y},$$

and consequently $m_1 = \epsilon y + \text{a constant}$.

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[13] This formulation, I believe, meets Robertson's contentions in his controversy with Keynes, without sacrificing anything essential. So long as saving is unequal to investment, income moves in the direction which will bring them into equality. That Keynes did not agree is unfortunate, since it would have strengthened rather than destroyed his central thesis. The reason for his refusal may have been his unwillingness to make the system explicitly dynamical.

For the purpose in hand, the constant may be zero. The hypothesis of constant velocity requires that

$$m_1 v_1 = y.$$

Therefore we arrive at the result that

$$(7)\quad v_1 = 1/\epsilon.$$

This is, indeed, intuitively obvious from the manner in which the problem is stated, and it would have been unnecessary to derive it, were it not for the fact that it has been so generally ignored. Yet it is an important result, for it establishes a connection between one of the oldest branches of economic thought and one of the newest. It is not, however, an attempt to palm off the fallacies of the quantity theory in the guise of the multiplier, for it is not asserted that v *is* the multiplier. The average velocity of active and idle money together will remain constant only in the very special case that all new active money results in an exactly equal proportional increase in total money, so that a change in the one is a change in the other. At the other extreme is an expansion financed out of idle money, so that, total money remaining constant, velocity rises proportionately to income. Autonomous changes in the quantity of money have no effect, except to change the velocity of money, unless, through the rate of interest, investment is changed from what it would have been otherwise. But this is probably too weak a relation to have much effect, especially in the short run.

The nature of the solution of (5) is best shown by considering the usual example of the sudden imposition of a constant rate of investment. Let

$$i(t) = \begin{cases} 0, & t < 0 \\ I, & t \geqq 0. \end{cases}$$

Then the complete solution is

$$(8)\quad y = \left(Y_0 - \frac{I + H}{1 - \alpha} \right) e^{-\frac{(1-\alpha)}{\epsilon} t} + \frac{I + H}{1 - \alpha}$$

where Y_0 is the initial value of y. This gives an increase which tapers off to the instantaneous multiplier value, much in the same manner as the usual multiplier block diagram. We may define a useful concept, the time constant, τ, of the propagation mechanism, as the time in which the movement towards the final value of income is approximately two-thirds completed.

$$(9)\quad \tau = \frac{\epsilon}{1 - a}\,.$$

If ϵ is one-fourth year, for example, and a is .6, then five-eighths of a year after the expenditure was begun, the multiplying process will be two-thirds accomplished. After two years it will be more than 95 per cent achieved. The shorter the lag and the smaller the marginal propensity to consume, the more quickly the process goes.[14]

This mechanism is similar to, but not identical with, the usual multiplier. The spending of money results in further incomes, but with a kind of distributed lag. Some new income is generated soon, some later, and some still later. The usual dynamic multiplier assumes a uniform lag—all bits of income lead to further incomes, a "day," or "week," or "month" later. Some kind of probability distribution is more realistic for the lag. One might regard the continuous multiplier as a convenient first approximation to one with a uniform lag. If the lag term $y(t - \epsilon)$ be expanded in a Taylor series, and all but the first two terms dropped, then the difference equation turns over into (5). But I prefer to consider it in its own right, as one that is probably closer to reality than the other, which, it should be remembered, is at best a crude simplification.

From the figures for the income velocity of money, we may put an upper limit on the length of ϵ. The average velocity in the United States or England is around 3 per year. Therefore the velocity of active money cannot be lower than this, and will be higher to the extent that idle money exists. Thus ϵ has a maximum value, in the advanced industrial countries, of one-third and may be only one-fourth or one-fifth. Professor Angell gives remarkably impressive evidence of the long-run stability of this figure, in spite of rather large changes in both money and income. Thus the average value of velocity for 1909–1918 was 3.11, whereas for 1919–1928 its average was 3.08.[15] This is not surprising, if we reflect that idle money is ordinarily a transient, cyclical phenomenon. Furthermore, there is an evident tendency for the supply of money to move in sympathy with the level of output, thus avoiding large hoards. The arguments of the quantity theorists may explain this long-run stability, and support the view that decade average velocity figures are not far from the true velocity of active money.

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[14] Fritz Machlup, *International Trade and the National Income Multiplier*, Phila., 1943, p. 51.

III. A FLEXIBLE ACCELERATOR

Almost everyone is agreed that investment constitutes the key to the problem of cycles. Some theorists go so far as to say that the investment process, by itself, contains practically the whole of the explanation. The classic exposition of this view is Professor Schumpeter's, and it is in this direction that Professor Hansen appears to incline. In opposition to this are most of the "self-generating" theories, which maintain that the whole of the economic structure determines the periodic reversals. Neither theory alone is, in my opinion, quite satisfactory. The structural approach is condemned to the sterility of one constantly repeated wave form, which must either die out or explode in ever-increasing violence. The innovational theory handles both these difficulties well, but is not altogether convincing on what constitutes the strong point of the other theory—the unmistakable element of regularity in the recurrence of booms. The mere fact of the bunching of innovational investments cannot be taken as proof of an inherent tendency. The circumambient economic structure may alternately inhibit and encourage investment, and hence contain the explanation of the bunching. Surely, a combination of the two types of theory possesses the desired qualities.

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[15] Cf. the appendix to *The Behavior of Money*.

In his treatment of capital and investment, Keynes followed traditional theory. Given a rate of interest, there is, under given conditions, a corresponding amount of capital, but should the existing amount not correspond, there is no specification of the size of investment, i.e., no determination of the rate of progression from the old to the new equilibrium quantity of capital. This lacuna can be found in many economic theories, but it is crucial in capital theory. One way of filling it is by consideration of Keynes' point that the rate of current investment controls the cost of capital goods, and hence has a negative effect on the marginal efficiency of capital. Keeping to linear relations, we may then represent the marginal efficiency of capital by

$$(10)\quad r = -\mu k - \nu \dot{k} + \Lambda$$

where r is the rate of interest and Λ a shift parameter. With a given rate of interest and a given Λ, the rate of investment, as well as the amount of capital stock, becomes completely determinate. The difficulty with this formulation is that the schedule is subject to large shifts. Indeed, the role of the shifts is probably much greater than that of r. These changes in the value of Λ are partly the result of changed expectations about future output, and partly the result of innovations. We may say that the schedule holds only for a given state of technique, and for a given level of present and expected income. Making the simplest possible assumption about the influence of income (proportionality), means inserting the acceleration principle into the marginal efficiency of capital. Stated in this context, the accelerator becomes suitable for business cycle analysis.

The rate of interest is generally held to play little role in the investment process, and, in any case, its variation cannot be explained by the reduced system under consideration here.[16] Therefore its variation, along with changes in expectations, may be absorbed into the innovational shift function, which we may call $\phi(t)$. With a convenient redefinition of constants, the marginal efficiency of capital, (10), expanded to include the acceleration principle, and with the rate of interest neglected, may be written as

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[16] The role of monetary policy may easily be taken into account by keeping r explicitly in (10) or (11). The rate of interest is related to idle money, which

$$(11)\quad \xi\dot{k} + k - \kappa y = \phi(t)$$

where ξ is a constant and κ is the acceleration coefficient.

There is an alternative and illuminating way of appraising this formulation. It implies that there is an asymptotic approach to any persisting equilibrium level of capital; it is simply a flexible form of the accelerator. When there is no net investment, i.e., when perfect adjustment exists, capital is linearly related to income (for a given state of technique, etc.). If equilibrium is not attained, then the rate of investment is proportional to the difference between the equilibrium or ideal quantity of capital, and the actual quantity, as can be seen by rearranging (11) as follows:

$$\dot{k} = 1/\xi(\kappa y + \phi - k).$$

Like κ, ξ has the dimensions of time, and may be interpreted as meaning that any excess or deficiency of capital is removed at a rate which would abolish it in ξ years, if nothing else changed. The ordinary accelerator implies that capital is always perfectly adjusted to income. This is its major shortcoming, for we know that there are times of excess capacity, and other times of short capacity.

The nature of the flexible accelerator can most easily be understood by studying the reaction to a sudden increase of income to a new constant level. If, for convenience, we take the previous level of income, capital, and investment as zero, we have, for an increase of income to Y at $t = 0$,

$$(12)\quad k = -\kappa Y e^{-t/\xi} + \kappa Y. \qquad (t \geqq 0)$$

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is linked to active money through the total quantity, and active money is dependent on income. All this is a subsidiary matter for our present purposes, however, since r in fact does not vary much.

Thus, capital gradually approaches the value given by the customary accelerator as a limit. Investment, being the first derivative of k, decreases from a maximum value of $\kappa Y/\xi$ to zero.

$$(13)\quad i = \dot{k} = (\kappa/\xi)Ye^{-t/\xi}.$$

IV. AN OSCILLATORY MECHANISM

The flexible accelerator, acting as the generator of income, combined with the dynamic multiplier, functioning as the propagator of income, constitutes a determinate system which can explain business cycles. In order to show this, we consider the homogeneous part of the two equations, setting $\phi(t) = 0$ and $H = 0$.

$$(5a)\quad -\dot{k} + \epsilon\dot{y} + (1-\alpha)y = 0.$$
$$(11a)\quad \xi\dot{k} + k - \kappa y = 0.$$

The characteristic equation for these simultaneous equations is

$$(14)\quad \xi\epsilon\lambda^2 + [\xi(1-\alpha) + \epsilon - \kappa]\lambda + 1 - \alpha = 0.$$

Since this equation for λ may have either real or complex roots, the coupled system may have either real exponential or oscillatory solutions. The condition for the latter type solution is

$$(15)\quad [\xi(1-\alpha) + \epsilon - \kappa]^2 < 4\xi\epsilon(1-\alpha).$$

Quite plausible values of the constants satisfy this condition, so that such a model is a possible basis for a theory of the intermittent breakdown of capitalism. If it is to be a satisfactory explanation of these cycles, it must be stable, but not too stable, and it must give a relatively long period. We may require, for example, that the period be 9 years, and that the amplitude of swing decline by one-half in one cycle and by three-fourths in two, in the absence of outside disturbances. These two requirements put the following conditions on the constants (taking ϵ to be .25):

$$(16)\quad 1 - \alpha = .124\xi;$$
$$(17)\quad \kappa = (1 - \alpha - .05)\xi + .25.$$

These conditions are in turn satisfied by the following reasonable set of values: [17]

$$(18)\qquad \begin{cases} \alpha = .60; \\ \kappa = 1.4; \\ \xi = 3.2; \\ \epsilon = .25. \end{cases}$$

Only ξ seems to be higher than one might expect.

In view of the unfavorable empirical evidence presented in other sources, it may seem altogether unconvincing to base a cycle theory on the acceleration principle. ". . . it is a mistake, at least from the short-run point of view," says Professor Hansen, "to place too much emphasis upon the Principle of Acceleration." [18] It is conceivable that the accelerator is not a useful tool after all, but its attractions are nevertheless great. It is the simplest expression of the one fundamental dynamic fact in economics—that capital is a stock, investment a flow, and that both are intimately related to income.

In addition to its *a priori* plausibility, the accelerator can explain the two basic, well-established facts about the cycle, the greater relative violence of investment fluctuations, and their lead over income and consumption. The modified accelerator also explains the existence of excess capacity in certain phases of the cycle. This is easily seen to be true by considering a representation in the form of rotating vectors, a device of considerable convenience in oscillation problems. A complete rotation represents a full cycle, and hence the angle (divided by 360°) between two vectors shows the fraction of a cycle lead or lag between them. In the accompanying diagram, equation (5a) is interpreted by letting investment, $\dot{k}$, be the vectorial sum of $(1-\alpha)y$ and $\epsilon\dot{y}$. Utilizing the values given in (18), investment is seen to lead over income by something less than one-eighth cycle or about one year, while capital lags behind income by less than one-fourth cycle. Equation (11a) states that investment is proportional to the excess or deficiency of capital. Therefore, excess capacity appears before the middle of the downswing, and lasts through the early upswing. This behavior agrees with Keynes' only explicit statement about a closed cycle theory, though he based his

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[17] Since (16) and (17) represent only two equations in three unknowns, an arbitrary value may be assigned to one of the three, and the equation solved for the other two. The value $\alpha = .60$ is close to the "cyclical" propensity to consume, and may therefore be used as a starting point to determine ξ and κ.

[18] A. H. Hansen, *Fiscal Policy and Business Cycles*, New York, 1941, p. 282.

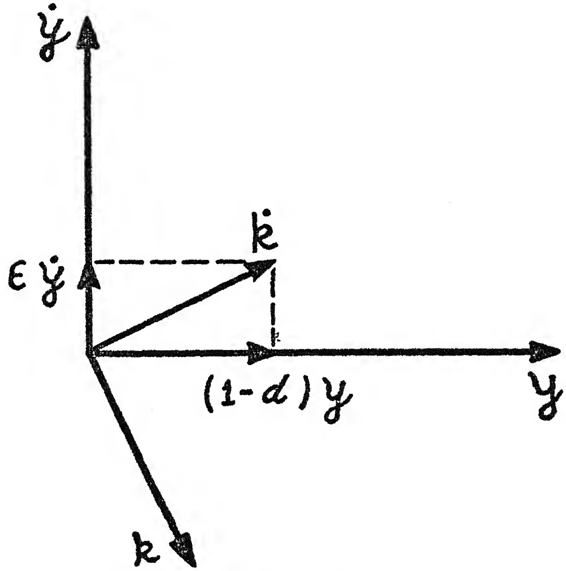

FIGURE VI

conclusions more on the life span of capital goods than upon the acceleration principle. ". . . if the rate of investment falls below a certain minimum level," he said, "it is merely a question of time (failing large fluctuations in other factors) before the marginal efficiency of capital rises sufficiently to bring about a recovery of investment above this minimum." [19] The flexible accelerator is no doubt rather too rigid, because it implies a gradual falling off of investment with declining income, whereas, once the horizon darkens, there is little to prevent a rapid drop. This might explain the asymmetry between upswing and downswing, although such asymmetry can also result from the tendency for autonomous investment to be concentrated in the upswing.

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[19] J. M. Keynes, *The General Theory of Employment, Interest, and Money*, New York, Harcourt, Brace and Co., 1937, p. 253. Reprinted by permission.

V. THE SECULAR RELATION OF INCOME TO CONSUMPTION AND CAPITAL

As discussed thus far, the mechanism has one gross shortcoming. If it explains the cycle, it cannot serve to explain the trend, or vice versa. If it oscillates, it does so about a dead level; there is no progression to it. The problem may be attacked by postulating a dynamical consumption function, or by including expectations explicitly in the marginal efficiency of capital. Before resorting to complications, however, it is desirable to take into account two elementary known facts of overwhelming importance. Capitalism has been characterized by large population growth and large autonomous investment outlays. These cannot be neglected. It makes a great difference to an aggregative consumption function, whether an increase in income is, or is not, accompanied by an increase in population. Likewise, it makes a great difference whether an increase in income is, or is not, accompanied by the exploitation of new techniques.

If one consumer behaves, on the average, like another, we may write for a single, typical consumer, the equation

$$(19)\quad c_i = \alpha y_i + h.$$

Then the consumption function for n consumers is

$$(20)\quad c = \sum_{i=1}^{n} c_i = \alpha \sum_{i=1}^{n} y_i + nh.$$

Replacing nh by $\psi(t)$, and Σy_i, by its equivalent, y, we may write (20) as

$$(20a)\quad c = \alpha y + \psi(t).$$

If this consumption function is combined with the flexible accelerator, we will get oscillations about a trend. For a population growing at a constant percentage rate, 100ζ, we may consider the trend of income by itself, and thus calculate the secular marginal propensity to consume, $\bar{a}$. If this be done, we find that

$$(21)\quad c_{\text{trend}} = \left(1 - \frac{\kappa\zeta}{1 + \xi\zeta}\right) y_{\text{trend}}.$$

Thus for this and other similar models, we get the important result that the secular propensity to consume has nothing to do with the cyclical one. A 4 per cent rate of growth with $\kappa = 1.4$ and $\xi = 3.2$, gives $\bar{a} = .95$, though $\alpha = .60$. In any case, barring absurd values for κ, $\bar{a}$ will be greater than α. This suggests an explanation of the anomalous behavior of the consumption function as between trend and cycle. The calculation is incomplete, however, because no account has been taken of innovations.

An alternative and perhaps more realistic way of approaching this problem is to assume that each unemployed person consumes a given amount, b, by means of dole, charity, past savings, or incurring debt. Then, if we call n the number employable, l the number employed, and u the number unemployed, the consumption function becomes

$$(20b)\quad c = \alpha y + lh + ub.$$

If we assume that employment is a constant proportion, ν, of national income, (20b) may be rewritten as

$$(20c)\quad c = \left\{\alpha + (h - b)\nu\right\} y + bn(t).$$

The result is formally similar to (20a), but the aggregate marginal propensity to consume will be smaller than the individual and the shift parameter must be differently interpreted.

The complete coupled system constituted by the dynamic multiplier, taking account of population growth, and the flexible accelerator, allowing for changes in technique, is given by

$$(22)\quad -\dot{k} + \epsilon\dot{y} + (1 - \alpha)y = \psi(t)$$

and

$$(23)\quad \xi\dot{k} + k - \kappa y = \phi(t).$$

It is convenient to restate these in combined form, using D to represent the differential operator. Equations (22) and (23) may be restated in the following form:

$$(24)\quad \left\{ \epsilon\xi D^2 + [\xi(1-\alpha) + \epsilon - \kappa]D + (1-\alpha) \right\} y = (\xi D + 1)\psi + D\phi;$$

$$(25)\quad \left\{ \epsilon\xi D^2 + [\xi(1-\alpha) + \epsilon - \kappa]D + (1-\alpha) \right\} k = \kappa\psi + (\epsilon D + 1 - \alpha)\phi.$$

Both k and $\bar{y}$ will have three solutions, which I shall indicate by subscripts, a general one for the homogeneous equation with $\phi = 0$ and $\psi = 0$, and particular solutions for the non-homogeneous equations, one with $\psi = 0$ and one with $\phi = 0$. The homogeneous, i.e., the oscillatory, solution has already been discussed. It might be noted that there appear to be four arbitrary constants, but that two are spurious since the amplitude ratios between income and capital are determined. The particular solutions cannot be undertaken until $\psi(t)$ and $\phi(t)$ are specified. $\psi(t)$ is a smooth function proportional to population. $\phi(t)$ is a highly irregular function into which, if we desire, many things may be put, e.g., war and relief expenditures, as well as innovational outlays.

At this point, we are in a position to give a rough answer to the central question of this essay: can the same multiplier-accelerator mechanism explain quantitatively the main features of both the secular and cyclical behavior of income, consumption, and capital? That the cyclical movement can be explained has already been shown. The question is whether the same values for the structural constants can yield the apparently quite different values for $\bar{\alpha}$ and $\bar{\kappa}$ determined from secular data. According to the statistics of Professor Kuznets what is to be explained is a 3.8 per cent rate of growth, a $\bar{\kappa} = 3.4$ and an $\bar{\alpha} = .87$.

To explain secular growth, both ψ and ϕ must develop exponentially at rates of ζ_1 and ζ_2 respectively. ψ has shown a rate of growth of around 3 per cent, though with an unmistakable decline recently. As to ϕ there is no evidence, but I shall assume, for the moment, that it has such a trend. These rates imply a trend rate of growth in y given by

$$(26)\quad \dot{y}/y = \frac{\zeta_1 y_1 + \zeta_2 y_2}{y_1 + y_2}.$$

Therefore y will have a rate which is a weighted average of the two constituent rates. If ζ_1 is 3 per cent, then ζ_2 must be between 4 per cent and 5 per cent, to explain the observed 3.8 per cent rate of growth of income. It will involve only a slight error and much simplification if we assume $\zeta_1 = \zeta_2 = \zeta = .038$. In this case we may write

$$(27)\quad \phi = L\psi$$

where L is a constant.

The Kuznets data are in the form of sums over a decade. The corresponding operation in our model is to integrate over the same length of time. Unfortunately a decade is not quite equal to the average length of the cycle. Nevertheless, in what follows, the assumption will be made that the Kuznets sums are taken over the exact length of a single cycle. From the data we find that to a good approximation

$$(28)\quad \int_{sT}^{(s+1)T} k\,dt = \bar{\kappa} \int_{sT}^{(s+1)T} y\,dt$$

where T is the period, s is any positive integer, and $\bar{\kappa}$ has the value 3.4. In what follows it should be understood that integration is always over one complete cycle. By virtue of (25) we have

$$(29)\quad \int k\,dt = \int k_1\,dt + \int k_2\,dt + \int k_3\,dt,$$

where the first two terms are the particular solutions, and the third is the oscillatory one, and hence zero. From equations (24) and (25) we get

$$(30)\quad \int y\,dt = \frac{(1+\xi\zeta)}{g}\int \psi\,dt + \frac{\zeta}{g}\int \phi\,dt,$$

and

$$(31)\quad \int k\,dt = \frac{\kappa}{g}\int \psi\,dt + \frac{\epsilon\zeta + 1 - \alpha}{g}\int \phi\,dt,$$

with

$$g = \epsilon\xi\zeta^2 + [\xi(1-\alpha) + \epsilon - \kappa]\zeta + 1 - \alpha.$$

From (30) and (31), and taking note of (27), we have

$$(32)\quad \int k\,dt = \frac{\kappa + (\epsilon\zeta + 1 - \alpha)L}{1 + \xi\zeta + \zeta L}\int y\,dt.$$

Therefore

$$(33)\quad \bar{\kappa} = \frac{\kappa + (\epsilon\zeta + 1 - \alpha)L}{1 + \xi\zeta + \zeta L}.$$

It is evident that in no case does the secular $\bar{\kappa}$ give the correct value for any systematic relation between income and capital. It depends in part on the true κ, and in part on all the other structural constants, particularly α. Substituting the reasonable cyclical values of the constants given in equation (18), the result is

$$\bar{\kappa} = \frac{1.4 + .41L}{1.12 + .038L}.$$

The only free factor is L, since on this point there is no evidence. If the ratio, L, of ϕ to ψ were 8.9, the $\bar{\kappa}$ would have the observed value of 3.4, but in any case, over a wide range of L there will be considerable divergence between the two κ's. Precise agreement is scarcely to be expected. The purpose of this calculation is essentially illustrative; it is to show that a difference does exist and give a concrete example. The ease with which the combined multiplier and accelerator can explain both is remarkably impressive.

We may also investigate the secular $\bar{a}$.

$$(34)\quad \int c\,dt = \int y\,dt - \int \dot{k}\,dt = \int y\,dt - \zeta \int k\,dt$$

$$= (1 - \zeta\bar{\kappa}) \int y\,dt.$$

Therefore

$$(35)\quad \bar{a} = (1 - \zeta\bar{\kappa}).$$

If $\bar{\kappa} = 3.4$, we get the correct value of .87 for $\bar{a}$.

VI. THE IRREGULAR SHIFTS IN THE MARGINAL EFFICIENCY OF CAPITAL

The function $\phi(t)$ is essentially irregular, and though we might fit a trend to it, such a trend would be merely descriptive. Therefore the kind of solution given in the last section is incomplete. No analytical solution can be given if $\phi(t)$ is taken, as it must, to be an arbitrary, historically given function. But there is a useful method available for handling such an arbitrary driving function. We define a *unit response*, as the system's response to an increase or decrease of one unit in $\phi(t)$. Then we approximate $\phi(t)$ by a series of steps which are multiples of the unit steps. Each step will set in motion a wave train, large or small depending on the size of the step, and the behavior of $y(t)$ will be given by the sums of all these wave trains in varying stages of dying out.

The general solution of the associated homogeneous equation of (24) is

$$(36)\quad y = Y_1 e^{-ut} \cos vt + Y_2 e^{-ut} \sin vt$$

where

$$u = \frac{\{\xi(1 - \alpha) + \epsilon - \kappa\}}{2\epsilon\xi}$$

and

$$v = \sqrt{\frac{1-\alpha}{\epsilon\,\xi} - u^2}.$$

If

$$\phi = \begin{cases} 0, t < 0 \\ 1, t \geqq 0, \end{cases}$$

a particular solution is

$$(37)\quad y = \frac{1}{1-\alpha}.$$

The complete solution is the sum of (36) and (37). If we determine the arbitrary constants from the initial conditions, $y(0) = 0$ and $\dot{y}(0) = 0$, then the unit response, for $t \geqq 0$, is

$$(38)\quad \frac{1}{1-\alpha}\left[1 - e^{-ut}\cos vt - \frac{u}{v}e^{-ut}\sin vt\right]$$

We may call the unit response $\Omega(t)$, with the proviso that it is zero for $t < 0$. Inserting the values of the constants given by (18),

$$\Omega(t) = 2.5\left[1 - e^{-.081t}\cos .703t - .115e^{-.081t}\sin .703t\right].$$

After a lapse of time this becomes negligible. If we let $t = 0$ at a time when the effects of $\phi(0)$ are negligible, then, summing all the solutions,

$$(39)\quad y(t) = \phi(0)\Omega(t) + \sum_{\tau=\Delta\tau}^{\tau=t} \Delta\phi(t)\Omega(t-\tau)$$

where $\Delta\tau$ is the unit of time used in our step-wise approximation to $\phi(t)$.

These shifts (and they may be either positive or negative) in the marginal efficiency of capital will distort the regular oscillations both as to period and wave form. One or several shifts will prolong the upswing or shorten the downswing. The absence of upward shifts, or the existence of weak ones only, will result in a mild boom and temporary cessation of the upward trend. It is in this manner that Professor Hansen interprets the experience of the 1930's. The altogether irregular behavior of the marginal $\bar{a}$ (it was 3.12 in the decade 1929–38) might be accounted for in some such manner.

Although autonomous and irregular shifts in investment account for much of the movement of income, formal cycle theory also plays an important role, for, in the absence of innovations, such theory explains why booms and downswings cannot continue indefinitely. Whatever degree of regularity exists in economic fluctuations must be ascribed to the elements represented by formal theories of fluctuations. The fact that impulses from innovational expenditure tend to be synchronized with the upswing (a fact which we accept as given, though a more elaborate theory should explain it), and that they are ordinarily positive, will presumably lengthen the average period, as compared with what it would have been in the absence of disturbances. Therefore the natural period, T, of the mechanism might be taken to be less than 9 years, which would lead to smaller and probably more realistic values for κ and ξ.

The vexatious problem of the maintenance of oscillations is also disposed of by the irregular shifts in the capital function. Left undisturbed, the economy would tend to lose its cycles, but by always exciting new ones, the dynamic effect of capitalist innovation is to circumvent this result. The violence of cycles may sometimes diminish and at other times increase, but so long as it is changing, capitalism will never lose its alternations of good and bad times.

The mathematical formulation of the problem requires too rigid and simplified an exemplification of economic life. But one must put to its credit the fact that all interrelationships are taken account of in a way that would be impossible in a more subtle verbal analysis. The precise effect of population growth on capital accumulation is allowed for, as well as the concomitant influence of that accumulation on income and consumption. The multiplier and the accelerator govern the cyclical behavior and, though in a complex fashion, also the secular response of the economy to the given historical contours of population growth and of technological evolution in latter-day capitalism.

VI

The Simple Mathematics of Income Determination

BY

PAUL A. SAMUELSON

I. INTRODUCTION

THANKS in large measure to Professor Hansen and his associates, advanced students in business cycle theory have become proficient in calculating a large variety of different "income multipliers." In fact the subject has become something of a black art. Black because, to the uninitiated, the jargon must necessarily appear mysterious if not vicious; and an art because even the most adept are hard put to it to remember all the complex terms required for any particular multiplier formula.

Once we drop the most simplifying assumptions concerning income determination, and once we begin to seek the answer to a number of different policy or factual questions, most of this complexity is intrinsic. But by no means all. A large part of the difficulty of the subject—looked at from the standpoint of teacher or pupil—results from the practice of working with "multipliers," rather than concentrating on the equilibrium conditions which give rise to these expressions. The relations determining income are logically prior to those describing the way the equilibrium income changes. They are also easier to remember, easier to handle without making over-narrow straight-line assumptions, and they easily yield the appropriate multiplier formula for any particular problem.

The present discussion is purely expositional, dealing as it does with problems that have been thoroughly thrashed out in the advanced literature. It attempts to show, with the use of the simplest mathematical language, (1) the simplest Keynesian model by which "saving and investment" determine income; (2) how government expenditure and taxes enter into this picture; (3) the role of international trade; and (4) how the corporation and its savings are to be handled.

II. THE HEART OF INCOME ANALYSIS

By definition, *national income* (at market prices), Y, can initially be set equal to the sum of consumption expenditure, C, and *net investment*, I:

$$Y = C + I$$

If Keynes had stopped with this identity, we should be left with an indeterminate system. In his simplest model of income determination, he added the following two hypotheses: (a) consumption is a function of income, and (b) investment may provisionally be taken, at any one time, as a constant. Mathematically, these relations may be written

$$C = C(Y) \text{ and } I = \bar{I}$$

When we substitute these into our first identity, we come up with the simplest Keynesian income system:

$$Y = C(Y) + \bar{I} \tag{1}$$

This is a determinate system, being one equation to determine one unknown variable. While much of the anti-Keynesian and Keynesian world was still arguing over the tautological character of the Keynesian concepts, Professor Hansen had quickly cut through the non-essentials to isolate the critically important role of the propensity-to-consume schedule, as embodied in this fundamental equation.

Equation (1) is crucially important for the history of economic thought. It is the nucleus of the Keynesian reasoning. If it *in no way* gives insight into the analysis of employment, then the Keynesian system is sterile and misleading. In its oversimplification, this relation must be compared with two other seminal single equations which contain by implication much of the remainder of economic theory: namely the equating of supply and demand to determine market price,

$$D(p) - S(p) = 0;$$

and the determination of a firm's best output, q, (or anything else) by the condition that its profits, π, be at a maximum through the balancing of the effect of any decision on *total revenue,* R, and *total cost,* C,

$$\frac{d\pi}{dq} = \frac{dR(q)}{dq} - \frac{dC(q)}{dq} = 0$$

Geometrical Representation

Graphically, the simplest Keynesian equilibrium can be shown on a by now familiar 45° line diagram.[1] On the vertical axis the consumption function, $C(Y)$, is plotted against income. Investment is then superimposed onto consumption. The two together constitute the right-hand side of equation (1). The left-hand side, Y, is simply income itself plotted against income, or in short a 45° line. The intersection of $C(Y) + \bar{I}$ with the 45° line gives us our simplest "Keynesian-cross," which logically is exactly like a "Marshallian-cross" of supply and demand.

As an alternative to this geometrical presentation, we may let the intersection of a saving schedule with investment depict the determination of income. This amounts simply to transposing the consumption term in equation (1) over to the left-hand side, which now gives us the difference between income and consumption, or what may be called the *propensity-to-save* schedule, $S(Y)$. In its new version (1) reads,

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[1] See, for example, the contribution of Robert L. Bishop, p. 319, in this volume.

$$Y - C(Y) = \bar{I} \text{ or } S(Y) = \bar{I} \tag{2}$$

As before, income is plotted on the horizontal axis; but now on the vertical axis we must allow for both positive and negative amounts of saving or investment. The amount of investment is plotted as a horizontal schedule. The saving schedule will intersect it from below to yield the same equilibrium income as is shown in the 45° line diagram.

How does the fundamental income equation yield us the usual multiplier? Very simply, when we ask for the change in income which results from a change in the parameter investment, $\bar{I}$.[2] From (1) it follows that $\frac{d\bar{I}}{dY} = 1 - C'(Y)$; or the multiplier formula becomes

$$\left[\frac{dY}{d\bar{I}}\right] = \frac{1}{1 - C'(Y)} \tag{3}$$

where C′ is the familiar margin propensity to consume at each different income level. Of the two equations, (1) and (3), the former is the more fundamental. By it we can appraise the effect of a large as well as a small change in investment, and without making the usual linear approximation to the consumption function.[3]

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[2] The only mathematical technique used in this paper is the simple one of determining the derivative of one variable, Y, with respect to another variable or parameter, *a*, to which Y is related by an implicit equation. Thus, if Y depends on *a* as determined by

$$F(Y,a) = 0$$

so that $dF = \frac{\partial F(Y,a)}{\partial Y} dY + \frac{\partial F(Y,a)}{\partial a} da = 0$, then necessarily

$$\frac{dY}{da} = -\frac{\frac{\partial F}{\partial a}}{\frac{\partial F}{\partial Y}}$$

where the symbol ∂ refers always to partial differentiation with "all other variables being held constant." An expression like C′(Y) or C′ always means $\frac{dC(Y)}{dY}$.

[3] If $C = a + bY$, a linear function on income, then the reader can show that

$$Y = \frac{1}{1-b}(a + \bar{I}) \text{ and } \Delta Y = \frac{1}{1-b}\Delta\bar{I}$$

Autonomous Consumption Shifts and Induced Investment

Before leaving the simplest Keynesian system, we may briefly mention that an autonomous upward shift of the consumption schedule will have exactly the same multiplier effects upon income as will an increase in investment. Thus, we may rewrite the consumption schedule to include a new element, *a*, of autonomous consumption—or $C = a + C(Y)$. The reader may easily verify that in the new Equation (1), the *a* term can be grouped with $\bar{I}$ with exactly the same quantitative effects upon income. "Investment dollars are high-powered dollars." Consumption dollars are, too.

The problem of "induced" investment introduces no formal difficulties. From a long-run economic viewpoint, it is doubtful that net investment can be related to a stationary income level in the way that consumption can. But in the short run, when the stock of capital is more or less constant, and when each different level of income can be thought of as a *change* in income as compared to previous periods, then it may be legitimate to write investment as a rising function of income, $I(Y)$. This *propensity-to-invest schedule* will intersect (from above) the *propensity-to-save schedule* of (2) to give the equilibrium level of income.

If we now wish to calculate a "multiplier" coefficient, the problem is more complicated. Exactly what question do we really wish to ask? What "multiplicand" are we changing in order to appraise its effect on income? The reader should verify for himself that once induced investment enters the picture, the appropriate multiplier to show the effect on Y of an *autonomous* shift, *a,* in either the investment or consumption schedule is given by [4]

If C is curvilinear, then

$$\Delta Y = \frac{1}{1 - \bar{C}'} \Delta \bar{I}$$

where now the $\bar{C}'$ will be some marginal propensity to consume intermediate between the old and new income situations, and which can only be evaluated with perfect exactitude by Equation (1).

[4] More generally, *a* may be an autonomous factor which shifts the I or C

$$\left[\frac{dY}{da}\right] = \frac{1}{1 - C'(Y) - I'(Y)} = \frac{1}{S'(Y) - I'(Y)} \tag{4}$$

III. TREATMENT OF GOVERNMENT IN INCOME ANALYSIS

So far we have been ignoring the presence of government expenditure on goods and services, G, and of net algebraic tax collections or withdrawals, W (positive when people pay taxes, negative when they receive transfer payments such as old-age pensions, veterans' allowances, etc.). Actually, Net National Product at market prices consists of three components

$$Y = C + I + G$$

To make our four-variable system determinate we must be willing to commit ourselves to some additional hypotheses. As before, we may provisionally make investment a constant. Since government expenditure is primarily a matter of policy (particularly, since we are excluding from G, relief and other transfer items which vary with income), we may provisionally set it equal to a constant. But now the dependence of consumption upon national income becomes more complicated. If we abstract from changes in the distribution of income—and empirical studies suggest that the *marginal* propensities to consume of different income classes do not differ enough to make this a disastrous oversimplification—then as a first approximation we can make consumption a function of "disposable income *after* net algebraic taxes or withdrawals," Y — W. By adding W as a variable, we must now demand that an additional hypothesis be made about its behavior. The simplest assumption is that net taxes or withdrawals are equal to some constant, set by policy. (We shall see in the next section that this is a rather misleading assumption.)

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schedules (either or both) in a *non-parallel* fashion. Our multiplier then becomes

$$\left[\frac{dY}{da}\right] = \frac{1}{\left(1 - \frac{\partial C}{\partial Y} - \frac{\partial I}{\partial Y}\right)} \frac{\partial(C + I).}{\partial a}$$

In symbols, our hypotheses are as follows

$$I = \bar{I},\ G = \bar{G},\ W = \bar{W}$$
$$C = C(Y - \bar{W})$$

which when substituted in the first definitional equation of this section, gives us a determinate equation for income

$$Y = C(Y - \bar{W}) + \bar{I} + \bar{G} \qquad (5)$$

The 45°-line diagram is well designed to illustrate this equilibrium; our only change is to add government expenditure (whether on capital or current goods) to private investment, and to shift the consumption function rightward (and downward) in a parallel fashion by a distance equal to net tax withdrawals, $\bar{W}$.

The saving-investment diagram is now not quite so convenient to interpret, and a number of alternative re-groupings of terms can be imagined. The method which is most closely akin to the definition of saving of the Department of Commerce would be as follows

$$Y - C(Y - \bar{W}) - \bar{W} = \bar{I} + (\bar{G} - \bar{W}). \qquad (6)$$

Consumption has been transposed to the left-hand side and $\bar{W}$ has been subtracted from both sides. The left-hand side, saving, is equated to private investment plus the deficit (whether financed by borrowing or printing of money).

An alternative possibility, which is perhaps nearer in formulation to the National Bureau definitions, would be to treat the deficit as negative government saving, and transpose it to the left-hand side, so that investment is equated to private and public saving. The only advantage to this second formulation is that it makes more plausible to beginning students such a statement as, "A reduction of taxes will raise income by reducing the community's saving." Intuitively, the student feels that a reduction of taxes will increase consumption, (private) saving, and income. Of course, either formulation is identical to Equation (5).

Now that income is a determinate function of $\bar{I}$, $\bar{G}$, and $\bar{W}$, it is simple to determine the appropriate multipliers for a unit change in each of these quantities. Using the technique described in the second footnote to this paper, it is easy to show that

$$
\begin{aligned}
&\left[\frac{dY}{d\bar{G}}\right] = \left[\frac{dY}{d\bar{I}}\right] = \frac{1}{1 - C'(Y - \bar{W})} \\
(7)\qquad &\left[\frac{dY}{d(-\bar{W})}\right] = \frac{C'(Y - \bar{W})}{1 - C'(Y - \bar{W})} = \left[\frac{dY}{d\bar{G}}\right] - 1
\end{aligned}
$$

In words, government expenditure has the same favorable effect on income as does private investment, both effects being equal to the reciprocal of the marginal propensity to save out of disposable income. Tax reduction will also increase income, but dollar for dollar its effects are always less than those of increasing expenditure. *In fact a dollar of expenditure always increases income by exactly one dollar more than does a dollar reduction of taxes.*

The "Balanced-Budget Theorem"

This is the basis for the significant "balanced-budget theorem."[5] According to this theorem, a deficit is not at all necessary for an expansionary fiscal policy. A balanced increase in expenditure and taxes—assuming no shift in the functional relationship of consumption to disposable income and no change in private investment—will result in an exactly equivalent increase in net national product.[6]

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[5] This theorem has been developed by several writers; see A. H. Hansen and H. S. Perloff, *State and Local Finance in the National Economy* (New York, 1944), pp. 245–246; T. Haavelmo, "Multiplier Effects of a Balanced Budget," *Econometrica*, Vol. XIII (1945), pp. 311–318; and the further comments by G. Haberler, R. M. Goodwin, E. E. Hagen, and T. Haavelmo, *Econometrica* Vol. XIV (1946), pp. 148–158; H. C. Wallich, "Income-generating Effects of a Balanced Budget," *Quarterly Journal of Economics*, Vol. LIX (1944), pp. 78–91; N. Kaldor's Appendix C to W. H. Beveridge, *Full Employment in a Free Society* (New York, 1945), pp. 346–347; P. A. Samuelson, "Full Employment after the War," in *Postwar Economic Problems*, edited by S. E. Harris (New York, 1943), p. 44. W. A. Salant's privately circulated memorandum was held up in publication by his war service. See also the early paper with similar notions developed from a different point of view by H. Somers, "The Impact of Fiscal Policy on National Income," *Canadian Journal of Economics and Political Science*, Vol. VIII (1942), pp. 364–385.

The explanations given for this paradoxical result are numerous:

(1) Mr. Salant pointed out that taxes do not enter directly into the net national product on the very first round, so that the two multiplier chains resulting from G and $-W$ are respectively

$$\begin{gathered} 1 + C' + (C')^2 + (C')^3 + \ldots\ldots, \\ -C' - (C')^2 - (C')^3 - \ldots\ldots \end{gathered}$$

with the difference being 1 regardless of the magnitude of C'.

(2) Another mode of explanation is to say that to some degree taxes must "come out of saving as well as consumption." Haavelmo has, with some justification, objected to this explanation on the ground that it erroneously suggests that the expansionary effect of a balanced budget is proportional to the quantitative size of the marginal propensity-to-save coefficient—which it is not.[7]

(3) A similar explanation follows the line that when the government's tax-financed expenditure is expanded, this amounts to adding an element in the system with a propensity to consume of unity. Increasing the weight of such an element must pull up the weighted-average propensity to consume of the community as a whole.

(4) The last explanation, which Hansen himself emphasized, stresses that tax-financed government expenditure constitutes a

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[6] If private investment is a rising function of total NNP, then the resulting increase in income and employment will be even larger; if, on the other hand, the net effects upon private investment are adverse, the increase in income will be smaller. Also it is quite possible that some changes in the distribution of disposable income might result, so that the saving and consumption schedules would shift in relationship to total disposable income. Consequently, the total income effects may differ, depending upon the type of taxes and the type of expenditures in question. For a development of this point, see R. A. Musgrave, "Alternative Budget Policies for Full Employment," *American Economic Review*, Vol. XXXV, No. 3, June, 1945, pp. 387–400.

[7] But he perhaps stretches his case too far when he argues that the same result is achieved when the marginal propensity to consume is exactly unity. For in that limiting case, our system becomes indeterminate and its multiplier 0/0 so long as $G \equiv W$. If $W \not\equiv G$, the system is inconsistent.

part of the "circular flow" of society's self-sustaining income. If the concept of net national product at market price had been adhered to from the beginning in our national income statistics, we should have more quickly emancipated ourselves from the Grover Cleveland notion of government expenditure as a *subtraction* from private national product.

To realize that government expenditure on goods and services is itself part of national product is almost, but not quite, enough to demonstrate the validity of the balanced-budget theorem. Just one further step of reasoning is necessary for a logically rigorous proof: It must be shown that private disposable income will actually remain constant when tax-financed government expenditure is superimposed upon it.

That private disposable income will remain constant is easily seen from Equation (5) or (6). Rearranging terms and designating *disposable income* as y and the deficit as D, (= G — W), we now have

$$(8) \qquad Y - \bar{W} = C(Y - \bar{W}) + \bar{I} + (\bar{G} - \bar{W}) \text{ or}$$
$$y = C(y) + \bar{I} + \bar{D}$$

Obviously, with $\bar{G}$ and $\bar{W}$ increased equally, with $\bar{D}$ and $\bar{I}$ unchanged, this equation determines y as a constant, $\bar{y}$. Hence, total Y must increase one for one with the superimposed amount of $\bar{G}$ or $\bar{W}$ added onto the fixed base of private disposable income, $\bar{y}$. Thus, the balanced-budget expenditure has a multiplier of exactly one; without recognizing this quantitative fact, we miss the kernel of the theorem.

A few concluding observations may be made: (1) The above analysis shows that there is, strictly speaking, no true unique multiplier to be associated with a deficit; i.e., $dY/d(G - W)$ is undefined until we know how the deficit is brought about in terms of the relative weights going to G and W. Such a "pseudo-multiplier" can be made to vary between minus and plus infinity. (2) Government transfer expenditure, as distinct from "exhaustive" expenditure on goods and services, tends to have a relatively weak multiplier exactly like that of taxes. In fact, raising taxes and transfer expenditure simultaneously will (apart from redistribution between income classes and indirect tax-distortion effects) have no effect on $\bar{W}$ or income. (3) The old Currie-Villard concept of "net income creating expenditure" of the government is seen to be slightly misleading. With no deficit, income may be created. It would be a little more appropriate to call this concept the "net disposable-income creating expenditure" of the government. This is because a unit increase in deficit has the same effect on disposable income as a unit increase in investment (or government expenditure) has on total net national product, as the reader may verify.

Collections from a Given Tax Structure vs. Changing Rates

Realistically, it is misleading to treat net tax withdrawals, W, as a direct policy parameter. Congress legislates government expenditure, $\bar{G}$; but it can never legislate tax receipits. All it can do is legislate tax *rates* which determine the government's net take at each different level (and composition) of national income. Any change in rates will necessarily change income, so that the legislators can never quite know what tax collections will be—without estimating the solution to the simultaneous equations of income determination.

Instead of assuming W constant, therefore, we shall assume that it is a given function of income for each set of Congressional decisions concerning different tax rates and transfer expenditures. For simplicity, we may assume that the complex of rates can be summarized in a single parameter, $\bar{r}$, which shifts the whole tax schedule up or down at each income level. Hence[8]

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[8] It would be more general to permit $\bar{r}$ also to "twist" the tax schedule as well as raise or lower it. This will produce only higher-order curvature effects on income which will be negligible for small changes in tax rates. In the general case, $W = W(Y,\bar{r})$ and $\frac{\partial W}{\partial r}$ depends upon the level of income.

Nevertheless, $\frac{dY}{dr} / \frac{\partial W}{\partial r}$ will be independent of any twist effect imparted by the term $\frac{\partial^2 W}{\partial Y \partial r}$.

$$W = \bar{r} + W(Y)$$

where $W'(Y) = \frac{\partial W}{\partial Y}$ is the marginal propensity to tax, a quantity which increases progressively with income. Our equation of income determination now gives us Y in terms of $\bar{G}$, $\bar{I}$, and $\bar{r}$:

$$Y = C[Y - \bar{r} - W(Y)] + \bar{I} + \bar{G} \tag{9}$$

If we wish to illustrate the equilibrium graphically, we can easily do so as long as net tax rates, $\bar{r}$, are constant. This being so, disposable income, $y = Y - \bar{r} - W(Y)$, becomes a determinate function of net national product, Y. Therefore, consumption itself becomes indirectly a function of Y, but now with a slope which is less than the marginal propensity to consume out of disposable income—perhaps by about a quarter. For fixed $\bar{r}$, we plot

$$C = C[Y - \bar{r} - W(Y)] = C(Y,\bar{r})$$

where

$$\frac{\partial C(Y,\bar{r})}{\partial Y} = C'(y)\,[1 - W'(Y)]$$

As we decrease $\bar{r}$, the consumption schedule is shifted leftward (and upward), but now by an amount greater than the reduction of taxes, and to an increasing degree as income increases.

Equation (9) will yield us an income multiplier with respect to $\bar{G}$ or $\bar{I}$, and also one with respect to $\bar{r}$. These three are the only basic multipliers possible. But when any given combination of these three parameters has been changed, it is always possible to relate the resulting change in income to the resulting change in any other variable of the system. Such a ratio can be called a multiplier if one pleases, but really it is a *mutatis mutandis* concept and had better be recognized as a chameleon creature whose numerical value can be changed at will by specifying different combinations of variation in the basic parameters, $\bar{r}$, $\bar{G}$, and $\bar{I}$. Examples of such a pseudo-multiplier will be provided later.

From Equation (9), we get the following two identical multipliers when we change only $\bar{G}$ or $\bar{I}$:

$$(10) \qquad \left[\frac{dY}{d\bar{I}}\right] = \left[\frac{dY}{d\bar{G}}\right] = \frac{1}{1 - \frac{\partial C(Y,\bar{r})}{\partial Y}}$$

$$= \frac{1}{1 - C'(y)\,[1 - W'(Y)]}$$

Because the marginal propensity to tax, W', is about one-fourth, the marginal propensity to consume out of national income will be only three-fourths as large as that out of disposable income. Consequently, our new multiplier will be much smaller, its weakness being due to the superimposition of "tax leakages" on top of "savings leakages." Even if people consume all their disposable income, the tax leakages would be a heavy drag—in either direction—on the system's movement.

For a change in $\bar{G}$, we could easily calculate a pseudo deficit multiplier:

$$(11) \qquad \left[\frac{dY}{dD}\right] = \frac{\frac{dY}{d\bar{G}}}{\frac{d(\bar{G} - W)}{d\bar{G}}} = \frac{1}{1 - \frac{\partial C}{\partial Y} - W'}$$

$$= \frac{1}{(1 - C')(1 - W')}$$

This may be very large indeed, because an increase in expenditure—after it has had a multiplied effect upon income—may be accompanied by a substantial increase in taxes, with the result that a sizable change in income is associated with a small change in deficit. For a change in $\bar{I}$ only, the deficit goes down and income goes up, yielding a negative pseudo deficit multiplier, whose exact value the reader can easily verify to be the reciprocal of the marginal propensity to tax.

Our last basic multiplier will be that giving the change in income resulting from a unit autonomous downward shift of the tax schedule:

$$\left[\frac{dY}{d(-\bar{r})}\right] = \frac{C'(y)}{1 - C'(y)\left[1 - W'(Y)\right]} \tag{12}$$

This results from differentiating Equation (9) with respect to $\bar{r}$ according to the stated rule of implicit functions. Note again, that (given the assumption of constant investment) tax reduction is less powerful than expenditure. Beardsley Ruml does not have quite the leverage of Harry Hopkins.

Three Paths to Full Employment

Professor Bishop, in another paper in this volume (p. 317), has elaborated upon the three fiscal paths to full employment: (1) deficit spending (a change in $\bar{G}$ only, in our notation); (2) spending without deficit (an equal change in $\bar{G}$ and $\bar{W}$); (3) a deficit without spending (a reduction in net taxes, W, brought about by reducing rates, $\bar{r}$, in $W[Y,\bar{r}]$). Any two of the three cases can be combined to produce the third. Bishop prefers to regard (2) and (3) as "pure" cases, the former involving only expansion of the government component of net national product, and the latter involving only a change in the private sector. His first case is then simply a blending of these two.

From the standpoint of policy manipulation, it might be preferable to regard (1) and (3) as pure cases, the former involving a simple change in $\bar{G}$, and the latter a simple change in $\bar{r}$ or $\bar{W}$. The balanced-budget case (2) would then represent an equal blending of the two pure cases. Either viewpoint is equally admissible.

However, one thing is clear: Financial orthodoxy aimed at minimizing deficits turns out to be really most radical from the standpoint of maximizing free, private enterprise and minimizing the role of government. To a *laissez-faire* economist, route (3), which is the least orthodox, is the best path to follow when income is to be expanded.

IV. INTERNATIONAL TRADE AND INCOME DETERMINATION

Very briefly, the treatment of international trade, neglecting the government and corporations, may be indicated. Net national product is now the sum of home-produced consumption goods, c, home-produced investment goods, I, and home-produced goods for export, X. In exports are included such invisible service items as shipping and (net) interest and dividends from abroad. Then

$$Y = c + I + X$$

If for simplicity we assume that imports, M, are all consumption goods, we may subtract and add M and rewrite this equation as

$$\begin{aligned} Y &= (c + M) + I + (X - M) \\ &= \text{total consumption goods} + \text{investment} + \text{foreign balance on current account} \end{aligned}$$

The Department of Commerce includes the foreign balance in private net capital formation.

As far as a single country is concerned, *exports* may often be taken as an autonomous factor, independent of income, without too great error. However, this is not strictly true with respect to some components of dividends payable to foreigners; also there will be some small reflex influence of our income on our own exports via the effect of our imports on income and imports of foreigners. These effects I disregard. Our demand for domestic consumption goods may be taken as a function of our national income, c(Y), exchange rates and relative prices being given. With domestic investment, $\bar{I}$, being given, our income equation becomes

$$Y = c(Y) + \bar{I} + \bar{X} \tag{13}$$

and our multipliers become

$$\left[\frac{dY}{d\bar{I}}\right] = \left[\frac{dY}{d\bar{X}}\right] = \frac{1}{1 - c'(Y)} = \frac{1}{S'(Y) + M'(Y)} \tag{14}$$

where the marginal propensity to consume, $c'(Y)$, falls short of unity by the marginal propensity to import, M', plus the marginal propensity to save, S'. The increase in imports and the pseudo balance of trade multiplier can be shown to be given respectively by

$$\frac{dM}{d\bar{X}} = \frac{M'}{M' + S'} \tag{15}$$

and

$$\frac{dY}{d(\bar{X} - M)} = \frac{1}{1 - c' - M'} \tag{16}$$

These formulae, and indeed the whole analytical problem of exports versus balance of trade as multiplicand, are formally analogous to the problem of government expenditure versus deficit.[9]

An autonomous shift in imports would, other things being equal, have no effect on domestic income, except possibly through indirect effects which are excluded in this discussion. But most things which affect the propensity to import, such as tariffs, exchange rates, and relative prices, would also affect the domestic propensity to consume in the opposite direction. Therefore, I shall not present a formal multiplier for a shift in imports.

Are there not circumstances under which the balance of payments, $(X - M)$, rather than X is the appropriate autonomous variable or multiplicand? If so, and if $C = c + M$ is a determinate function of income, $C(Y) = c(Y) + M(Y)$, then the appropriate income equation becomes

$$Y = C(Y) + \bar{I} + \overline{(X - M)} \tag{17}$$

and

$$\frac{dY}{d(\overline{X - M})} = \frac{1}{1 - C'(Y)} = \frac{1}{1 - c'(Y) - M'(Y)} \tag{18}$$

the same result as given just above. But now the pseudo-multiplier has become the genuine article; and through our change of hypothesis, the basic multiplier has become a chameleon.

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[9] See D. H. Robertson, "Mr. Clark and the Foreign Trade Multiplier," *Economic Journal*, Vol. XLIX (1939), pp. 354–356, for the classical treatment of this problem.

A few concluding observations may be made concerning international trade: (1) It is true that price changes, such as result from gold flows or exchange rates, find themselves supplemented by income effects. Nevertheless, when a country's exports increase, the resulting induced change in imports brought about by the income multiplier will always fall short of restoring equilibrium by an amount which depends on the relative strength of the marginal propensity to save and the marginal propensity to import. See Equation (15).

(2) When relative price changes are introduced into the picture, it becomes even more possible that domestic employment may be improved by a change in conditions which simultaneously expands exports and contracts the trade balance. This cannot be elaborated upon here.

(3) The cases in which the trade balance can be treated as an autonomous element are necessarily those in which—through the action of exchange control, exchange depreciation, or lender-borrower psychology—capital movements prove to be the bottleneck to which trade movements adjust themselves. The post-World War II world, where the availability of dollars calls the tune, may be such an example. In many if not most of such cases, imports are adjusted to exports so as to realize the preassigned balance of trade (for the foreign country at any rate) and the assumed relations between home-consumption goods, imports, and income cannot be assumed to hold, so that Equation (17) must be used with caution.

(4) Throughout part of this discussion, I have been following the customary loose practice of treating the foreign trade multiplier as if it were concerned only with the balance of trade and not with the more inclusive balance on current account. Usually, this does not matter since everyone realizes that shipping is just like exports, and tourist expenditure just like imports.

But confusion almost always arises in connection with interest and dividend payments. Very often one encounters the following type of statement: "Foreign lending for a while creates domestic employment. But finally, when interest payments become larger than new lending, the balance of trade will become unfavorable—*with necessary adverse effects upon domestic employment.*" The italicized passage is absolutely wrong.

Interest received from abroad, *per se,* increases domestic employment through its favorable secondary effects on consumption spending. To some (small) degree it increases our imports and thus tends to solve its own "transfer problem." But, alas, this effect is necessarily an incomplete one, so that exchange depreciation may be necessary for the paying country; the unfavorable employment effect of this must be compared with the favorable effect previously mentioned. Strangely enough, from the standpoint of modern income analysis, the Ohlin position of "conservation of purchasing power" becomes something of an archaic throwback to the classical Say's Law; and the orthodox economists (including Keynes), through bumbling reasoning, seem to have approached the correct position.

(5) A simultaneous increase in exports via reciprocal lowering of trade barriers will improve the efficiency of the international division of labor. But ordinarily its favorable effects upon employment are likely to be unimportant—except to the quite limited degree that the release of exchange controls can be expected to diminish thriftiness. This follows from Equation (17) and the earlier remarks concerning an autonomous shift in the import schedule.

Throughout the remainder of this paper, I shall follow the convention of including the foreign balance in *private net capital formation,* I, and shall not attempt to isolate that part of each component of net national product which can be imputed to home-owned factors. Therefore, international trade will be implicitly, rather than explicitly, in the income system.

V. THE BUSINESS CORPORATION AND INCOME DETERMINATION

The public's disposable income, y, falls short of net national product, Y, by more than taxes or net withdrawals once we admit the corporation into the picture. Taxes may now be split into business and personal, although the dividing line becomes rather arbitrary. But more important, corporate earnings (after corporate income taxes) may not all be paid out in dividends; undistributed profits may be ploughed back into the business, or in very bad times dividends may be maintained in excess of stated earnings. In short, algebraic net business saving, B, must be subtracted from net national product, along with taxes, before we get the disposable income of consumers.

If initially we ignore the role of government, our simplest income equation now becomes

$$Y = C(Y - \bar{B}) + \bar{I}. \tag{19}$$

An increase in investment will increase income; an increase in net business saving will, by itself, reduce disposable income, consumption, and income. The reader should be able to compute the appropriate multipliers $[dY/d\bar{I}]$ and $[dY/d\bar{B}]$. But first compare this last equation with our earlier treatment of government in Equation (5). It is easy to see that $\bar{I}$ and $\bar{B}$ are—in their relation to income and each other—playing exactly the same roles as did $\bar{G}$ and $\bar{W}$ respectively. This tells us immediately that a reduction in corporate saving is not quite so stimulating as an increase in investment.

The Income Stimulus of Corporations

It also casts light on the way to measure the stimulating influence of business enterprise. Among income analysts, the notion is thoroughly discredited that corporations are flooding the community with purchasing power whenever they pay out more in dividends than they receive in earnings. Fortunately, this is so because in most years, net business savings are positive rather than negative, and a logical application of the discredited viewpoint would have led to the anomalous conclusion that business enterprise is normally *deflating* the community. At the other extreme are those who seem to argue that any real corporate investments made out of ploughed back profits, are fully income creating so that when corporate taxes take away funds that would be added to surplus, employment is being greatly reduced.[10]

Probably most income analysts will prefer a third magnitude to measure the income stimulus emanating from corporations—namely, the difference between net business investment and net business saving (or what is the same thing, the difference between these gross magnitudes). Even this third measure, however, turns out to be not quite correct. Just as a balanced budget increases income with a multiplier of one, so will a balanced increase in business investment and business saving increase employment and income. But, and this the reader can verify by treating Equation (19) the way (5) was treated, there will be no secondary multiplier effects.

The Corporate Propensity to Save

It would be more realistic to modify (19) by making net business saving some function of net national product or $B = B(Y)$. This would give us

$$Y = C[Y - B(Y)] + \bar{I} = C(Y) + \bar{I} \tag{20}$$

and

$$\left[\frac{dY}{d\bar{I}}\right] = \frac{1}{1 - C'(Y)} = \frac{1}{1 - C'(Y - B)[1 - B'(Y)]} \tag{21}$$

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[10] This would be nearly true if stockholders treated undistributed profits as part of their disposable income for consumption purposes. This is not realistic because capital gains are not actually, or believed to be, equal to additions to book surplus.

Between the wars, the marginal propensity of corporations to save appeared much more important than that of families. This may, however, be a short-run cyclical phenomenon which would not be true of the secular growth of high and stable levels of income. Much more statistical study of corporate behavior is needed, especially since there is no reason to expect the invariance of any unique simple hypothesis.[11]

VI. SYNTHESIS

One of the great advantages of quantitative econometric model building is the fact that the writer is pinned down by the concreteness of the arithmetical figures to making specific hypotheses about all the relevant magnitudes. We may summarize, therefore, all the special cases considered up until now by considering the simplest complete income model which takes account of all components of national product.

As always, net national product is the sum of consumption, C, investment, I (including the net foreign balance), and government expenditure on goods and services, G:

$$Y = C + I + G$$

For simplicity, G and I may perhaps still be taken as autonomous factors, although the reader may easily modify this assumption. But if consumption is to depend upon disposable income, a long list of assumptions must be made concerning the numerous subtractions which first have to be made from net national product before we get disposable income. These subtractions are:

(a) *Business taxes*, BT, which we may assume are a function of income.

(b) *Net corporate saving*, B, which is the difference between corporate earnings (after taxes), E, and dividends, D, not to be confused with the deficit referred to earlier. Earnings may, for simplicity, be assumed equal to a function of income; although a good argument could be made for the alternative assumption that earnings before taxes are an invariant function of Y regardless of tax policy. Dividends may most simply be made a function of earnings, although their simple correlation coefficient has not been very high in the past.

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[11] For example, in (19) B may be made a function of I rather than Y giving a multiplier of $(1 - C'\frac{\partial B}{\partial I}) \div (1 - C')$.

(c) *Net personal taxes or withdrawals*, PW, where transfer payments have been treated as negative items. (Obviously, $PW + BT = W$.) This term PW might be made a function of "income paid out," but for simplicity in grouping it with business taxes, we shall make it a function of total net national product, or $PW(Y)$.

Mathematically our hypotheses are

$$\begin{aligned} C &= C(Y - BT - B - PW) = C(Y - W - B) = C(Y) \\ W &= BT(Y) + PW(Y) = W(Y) \\ B &= E - D = E(Y) - D[E(Y)] = B(Y) \\ I &= \bar{I},\ G = \bar{G} \end{aligned}$$

Our simple income equation finally becomes

$$Y = C[Y - W(Y) - B(Y)] + \bar{G} + \bar{I} \tag{22}$$

The interested reader may depict this equilibrium graphically, and introduce policy parameters—such as tax rates, $\bar{r}$, or corporate "thriftiness"—into various places in this equation and work out the appropriate responses.[12] He may also introduce induced investment if he pleases, or otherwise vary the hypotheses.

In all essentials, our final equation epitomizes the important previous equations, which are respectively (1), (5) or (9), (13) or (17), and (19) or (20).

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[12] The response to a change in $\bar{G}$ or $\bar{I}$ can be verified to be given by

$$\left[\frac{dY}{d\bar{G}}\right] = \left[\frac{dY}{d\bar{I}}\right] = \frac{1}{1 - C'(Y)\,[1 - W'(Y) - B'(Y)]}$$

where $B'(Y) = E'(Y)\ [1 - D'(E)]$. This is placed in a footnote to emphasize that the parent income equations are more important than their multiplier offspring.

In conclusion, I would not be doing justice to the pragmatic realism of Professor Hansen, if I did not emphasize the violence done to complex reality by the simplified statical abstractions of this paper.

PART TWO

Social Setting

I

Income Redistribution Reconsidered

BY

DAVID McCORD WRIGHT

EQUALITARIAN trends in modern economic literature have been carried so far as to approximate advocacy, in some instances, of virtually equal distribution.[1] Yet increasingly today it is realized that undiscriminating application of crude redistributive techniques can frustrate its own aims.[2] Brief summary, therefore, of certain considerations relatively neglected today seems desirable, and, in particular, more explicit integration is needed of economic standards with those political and philosophic ideas which are frequently the genuinely controlling factors.

I. FUNCTIONAL CONSIDERATIONS

"Functional" arguments for income redistribution—the believed necessity of increasing the propensity to consume—have been the most prominent in recent literature. The writer has stated his views on this problem in other papers, and, in order to focus attention on less discussed points, only a few conclusions will be given. It is submitted that there is no objectively necessary *secular* shortage of investment outlets relative to *secular* consumption trends.[3] Keynesian policy uncritically applied contains an implicit possible stalemate. Redistribution may increase demand but, by unduly burdening supply, could merely result in higher prices without proportionate output increases.[4] The secular investment problem is envisaged as one of ideological and institutional friction in which poorly planned and excessive redistribution plays an important role.[5] Also cyclical stability, so far as it concerns consumption, seems rather a matter of marginal than average propensities to consume, and income redistribution is too slow in effects to be an important factor here.[6] Redistributive arguments therefore should be founded more on matters of "reform" and political philosophy than mechanical functioning of the system.

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[1] Compare, for example, Professor Pigou's cautious treatment in his *Economics of Welfare*, 4th ed., Macmillan, 1938, Part I, Chapter VIII, with Mr. Tibor Barna's *Redistribution of Incomes 1937*, Oxford University Press, 1945—especially the concluding sections. I wish to acknowledge my indebtedness to Professor T. R. Snavely of the University of Virginia for many valuable references and suggestions in this regard.

[2] Cf. J. Keith Butters and John Lintner, *Effects of Federal Taxes on Growing Enterprises*, Graduate School of Business, Harvard, 1945; Kenneth E. Boulding, "The Incidence of a Profits Tax," *American Economic Review*, Sept. 1944, p. 567; E. D. Domar and R. A. Musgrave, "Proportional Income Taxation and Risk Taking," *Quarterly Journal of Economics*, May 1944, p. 388; A. P. Lerner, "Functional Finance and the Federal Debt," *Social Research*, Feb. 1943, pp. 45-46.

Concerning reform, impressions are frequent that "ethically neutral" mathematical reasoning yields scientific proof that total subjective "satisfaction" (utility? happiness?) is greatest with equal or nearly equal income distribution. But valid application, to income, of "scientific" laws of diminishing marginal utility, requires very severe assumptions.[7] One considers individuals with similar tastes and capacities for enjoyment over a *short* period. Familiar analogy with ice cream sodas, and other standard examples, then yields a plausible general inference that equal distribution furnishes maximum satisfaction.

The qualifications, however, are easily forgotten. Yet what of those individuals who derive special satisfaction from prospects of improving their income by their own exertions? [8] What of possible frustration of special instincts of workmanship involved in creating an expanding enterprise? What of possibly aggravated inequality of *political* power? What of the longer run? Perhaps substantial raises over a short period obey the "scientific" law. But a distinction similar to, and allied with, Samuelson's distinction between long- and short-run propensities to consume, suggests that most people, after an interval, assume the wants and expenditure patterns of their new level.[9] With wants thus expanding, assumption of diminishing utility seems highly questionable.

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[3] D. M. Wright, "'The Great Guessing Game'—Terborgh versus Hansen," *Review of Economic Statistics*, Feb. 1946; "Hopes and Fears, the Shape of Things to Come," *Review of Economic Statistics*, Nov. 1944.

[4] D. M. Wright, *The Creation of Purchasing Power*, Cambridge, Mass., 1942, Chapter III; "The Future of Keynesian Economics," *American Economic Review*, June 1945, p. 302.

[5] Wright, "The Great Guessing Game," *op. cit.; "Hopes and Fears," op. cit.*

[6] Wright, *The Creation of Purchasing Power, op. cit.*

[7] Cf. A. P. Lerner, *Economics of Control*, New York, 1944, Chapter 3; J. E. Meade, *Introduction to Economic Analysis and Policy*, Oxford, 1937, Part III, Chapter I.

It follows that at no time in the present real world are tastes of different income brackets similar. Furthermore reversal may be exceedingly painful. Assuming dollars substracted from *accustomed* income to have increasing significance to the loser, while those added decrease in significance, and remembering how far down we must go to obtain literal equality, it might well be that total utility lost would be more than total utility gained. This might appear a "short-run" phenomenon of the half century or more which memory of old habits and customs would take to die. But important individual differences do not result merely from different income. Drastic conditioning—wiping out the race memory of a generation—might induce somewhat greater similarity. But the "scientific law," so qualified, depends, for any surviving validity, on an idea definitely a value judgment: that conditioned taste similarity is desirable.

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[8] Cf. Nicholas Kaldor, "Welfare Propositions of Economics," *Economic Journal*, Sept. 1929, p. 551; C. Sutton, "Economic Theory and Economic Policy," *Economic Journal*, March 1937, p. 44.

[9] Pigou all but grants this temporal aspect of the problem in his discussion of a *sudden* increase in income leading to dissipation in "exciting pleasure" . . . "but if the income is maintained for any length of time this phase will pass," Pigou, *op. cit.*, p. 91. Pigou speaks of the more "intensely felt" wants of the poor. *As long* as we are dealing entirely with *subjective* satisfaction, I greatly doubt the scientific validity of this. There are wants which from some point of view of *social value judgment* we may prefer to satisfy rather than others. But so far as mere "enjoyment" goes, it is doubtful if they are more keenly "felt." If this were not the case, why would it be necessary to set up food-stamp plans, etc. to force the poor to "spend" their money more "sensibly." A wealthy woman may prostitute herself for social "advancement" as well as a poor one for food—or for beer.

II. QUALITATIVE STANDARDS

"Satisfaction" is an elusive term confusing "enjoyment" or "pleasure," derived from "consumption," with "contentment" or "happiness," yielded by a well-integrated creative life.[10] One *accustomed* level of income—if life be maintained at all—probably yields no more subjective "satisfaction," in the first sense, than another. Social progress concerns more the *quality* of men's lives than the cost of their plumbing. We must evaluate income redistribution by a qualitative standard.

One such standard is the idea that virtual income equality helps remove envy, rivalry, conflict, and frustration from economic life. But what is gained by eliminating rivalry for income if rivalry for power or prestige remain? Sparsely settled communities of meditating ascetics might have no government and no rivalry. But an integrated machine economy, even if the "state" has "withered," implies a hierarchy of technical operatives, and enough ambition must survive for men to *want* responsible operative positions. Yet even R. H. Tawney writes:

> "Equality" possesses more than one meaning. It may purport to state a fact or convey the expression of an ethical judgment . . . it may affirm that men are, on the whole, very similar in their natural endowments of character, and intelligence. On the other hand . . . that while they differ profoundly . . . they are equally entitled as human beings to consideration and respect, and that the well being of society is likely to be increased if all men are equally enabled to make the best use of such powers as they possess . . . If made in the first sense the assertion of human equality is clearly untenable. *It is a piece of mythology against which irresistible evidence has been accumulated.*[11] (italics added.)

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[10] Cf. J. S. Davis, "Standards and Content of Living," *American Economic Review*, March, 1945.

[11] R. H. Tawney, *Equality*, London, George Allen & Unwin, Ltd., 1929, p. 34. Reprinted by permission.

Granting this, however, and supposing we conclude it desirable to give at least some responsibility to those most competent in their respective fields, a problem of selection immediately appears. But those not selected may feel hurt. The argument against income difference, *per se*, closes its eyes to the profundity of the problem of frustration as we find it in our universe. Buddhism knows better. Thinkers who begin by abolishing capitalist income incentives because of possible frustration and conflict will soon find what is needed is abolition of *all* incentives: "The rage to live which makes all living strife." *Social* life cannot abolish rivalry—it can only change its form. For example, we may hold it bad to compete over business orders, while quite all right to compete over political elections, but the *fact* of rivalry remains.

Judged from the viewpoint of choosing among alternate forms of rivalry rather than eliminating it entirely, capitalist competition and income incentives are submitted to compare much more favorably. Two main standards must be noted: democracy of life and aspiration, and technological creativeness. While the analysis of Section I could be carried to denial of the value of material progress, we do not go so far. Mere gadgets will certainly never solve the fundamental problem of the true and the beautiful. But increasing technical efficiency reduces the amount of personally degrading labor, increases health, and, as a matter of history, has been accompanied by increasing social conscience and reduction of caste barriers.

Yet material progress is not a matter of mere "extension"—not simply making "more of the same." I find my chief sanction for the competitive order in what may be called the "Law of Deterioration of Self-perpetuating Groups." Where access to the top is conditioned on the consent of those already there, promotion is likely to go to the agreeable conformist rather than the able explorer. The group in power increasingly surrounds itself with yes men. The caliber of the "palace guard" rapidly declines.

One need set up no myth of perfect competition. But will anyone deny that, relative to the feudal planned states which preceded it, the capitalist upper classes in this country have been more open to access from below than any society we know of? And it is precisely because of this that the new technical idea has had so tolerable a chance.

Impressive relative short-run efficiency in certain instances of planning may often be explained by reference to what can be called the "idea of an Imperial Age." When ideological decay has undermined the sanctions for competitive change, when pressure groups begin to run riot, then centralized power may be called in to reassert the general welfare. Undoubtedly in the short run the new control will be more efficient. It may realize fairly fully the latent technical implications of the state of the arts when it took over. But the springs of further progress are being drained. Thus the flowering of Roman life under Octavian led to no comparable further development. A comprehensively planned state, however, implies eventual rule by a self-perpetuating group of specialists. For, in planning what industries shall expand, one almost inevitably plans what groups shall hold power. Tremendous authority is given to the vested interest, and technological stagnation seems an almost inevitable result.

Not merely technological change but political democracy are involved. Many speak as if mere holding of elections, plus universal suffrage, were sufficient to protect the individual despite changes in economic organization. There is a species of analogy and ideal of one vote, one dollar, one citizen. But anyone with political experience knows that, past the town meeting when the individual may have a direct hearing, and indeed even then, what counts is control of the organization, or influence with its members.

The masses may retain a residual veto, but its effectiveness, and the degree of abuse needed to call forth its exercise, depend largely upon the relative economic independence of the voter. The really crucial point is that in a large electorate the "outs," to be effective, must organize. And, if opposition leaders can be neutralized before organization is completed, the "ins" may retain power almost indefinitely. Terror is an obvious method. But comprehensive planning makes possible nearly equally effective, though more suave, economic reprisal. In a reasonably prosperous and competitive capitalism a dissenter has a chance to transfer beyond the reach of an oppressive boss. In a comprehensively planned state transfer beyond the reach of the ultimate employer is impossible. The voter then, in political or union election, is seldom really free.

In the same way selection by competitive examination tends also to create a narrow clique. For the examiners, even if honest, will want correct answers, and they are the judges of what is correct. Again the pattern will tend to freeze. When we consider the rancid bitterness and frustration possible in bureaucratic life, the bootlicking of superiors, the bullying of inferiors, and the hope long deferred of the seniority system, it is not so clear that capitalist methods of selection and motivation are the most unworthy. The frustration of inventive-creative impulses by the dead hand of self-perpetuating in-groups seems to me a qualitative issue of the first importance, most imperfectly compensated for by increased leisure. Nor does comprehensive planning appear so much an alternative to, as an extension of, monopoly capitalism. If, as some have charged, large business makes work less fun for most people, further concentration of control narrows yet more the group who can create and plan. We must not only consider the life of those few at or near the center of controls, but also the many who are far removed.

III. EQUALITY OF OPPORTUNITY

From the foregoing it follows that measures which disproportionately hamper the rise, on independent terms, of the *new* man, and the new enterprise, strike directly at the democracy and the technical creativeness of our society. These reflections, plus certain technical matters about to be reviewed, lead to standards of policy running in terms of a "fair chance," and an adequate turnover, rather than a more or less flat distribution curve. Social equality, as Tawney concedes, is not the same thing as equal income: "A community . . . marked by a low degree of economic differentiation, may yet possess a class system . . . rigidly defined . . . it may be marked by a high degree of economic differentiation and yet appear . . . comparatively classless." [12] The valid sanction (to our culture) for redistribution is, as I see it, simply the application of a democratic prejudice against allowing cumulative advantages of birth to pile up indefinitely. But an identical start means destroying the family. Redistribution is much the same thing as handicapping in a race and bears a strong punitive aspect. Nor should it be forgotten (however unpopular a view) that there are also disadvantages to being born wealthy. We must therefore be careful lest our policy backfire in unintended directions and lest it destroy valuable incentives. On this basis the fundamental point of this essay may be very briefly summarized: *The redistribution of income and wealth is not the same thing as the redistribution of opportunity*. A high progressive tax on large incomes may not increase the opportunities or the well being of the remainder of society—it may even decrease opportunity for the remainder of society.

One easily visualizes wealth redistribution as taking money from rich people and giving it to poor people. But this is true only in a very sophisticated sense. Money collected does not go directly to the poor—it goes to the government. It does not directly build up the poor—it builds up the government. The poor do not so often get purchasing power which they can spend as they wish, as services which they may not want. Nor do they get the full benefit of the taxes, but the taxes minus deductions (and possible wastage) for government service.

Mr. Tawney sets a goal of relative "equality of opportunity" as follows: "If every individual were reared in conditions as favorable to health as science can make them, received an equally thorough and stimulating education up to sixteen, and knew on reaching manhood that, given a reasonable measure of hard work and good fortune, he and his family could face the risks of life without being crushed by them, the most shocking of existing inequalities would be on the way to disappear." [13] Patently such a goal implies large scale government action. But government action is not restricted to such fields, and it is time that we began to evaluate more fully the immense possible amount of non-pecuniary privilege and resource consumption which can be made available to those in control.

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[12] Tawney, *op. cit.*, pp. 55–6. Reprinted by permission.

Liberals, particularly in this country, have advocated high progressive income taxes with the largely unconscious, or unexpressed, mental assumption that that is the way to get a nation of many middle-sized, independent businesses and many middle-class, independent people. But this assumption does not automatically fulfill itself. We may well get instead a nation whose economic life is carried on by the state, or by a few corporations owned or controlled by the state; and a population not of independent middle-class owners, but of dependent clerks and government employees. The flow of money and resources into government hands, and hence the power of the state, is directly increased without being at all sure that any reciprocal, or proportionately reciprocal, benefits will be forthcoming to the individual.

Mention of such possibilities leads to the second aspect of the problem—the actual diminishing of opportunity. For, as has been often pointed out (though scarcely sufficiently), income taxation, even at a flat rate, can well favor the man who is already rich at the expense of the man who is trying to better his economic status; the established old firm as against the enterprising new one. The addition of high progressive rates, under usual statutes, makes conditions much worse, and the result is frequently a policy for those "already there"—a policy which helps monopoly and increases social stratification.

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[13] Tawney, *op. cit.*, p. 193. I accept this quotation as a statement of fundamental goals. But, as he concedes, "Sharp contrasts of pecuniary income might still remain." And though he adds "as long as society were too imperfectly civilized to put an end to them," the argument of this essay is that income differences, like policemen and other evidences of lack of "civilization," have a very useful function and are unlikely to prove unnecessary for general society this side of the millennium. (Reprinted by permission.)

One of the most important and largely unconscious assumptions of the general public regarding income taxes is that the receipt of a large income means the possession of a large fortune. A closely allied idea is that the imposition of a heavy income tax redistributes a large fortune. Neither is correct. For the size of a man's income may bear little relation to his wealth, while the heavy taxation of income does not *per se* redistribute capital.[14]

Inequities of our income tax laws in the case of fluctuating income, and of insufficient deduction for loss, have received sympathetic attention, and some remedial action in recent years. Since the risky *new* firm, and venture capital generally, is likely to have a more fluctuating income, it is obvious that these disproportionate burdens fall directly upon the very class of people and of investments which we should be most anxious to encourage. Various authors have pointed out that adequate loss deductions and carry-over provisions could largely equalize the effective rate in such cases, and it is to be hoped that further reform on these lines will be forthcoming. What is less understood is that, even making all these adjustments, and even supposing a flat rather than a progressive rate, income taxation still bears disproportionately against the new man.

A firm which has already accumulated enough capital can afford to pay more than half of its income in taxes. Not so the firm with little capital which is endeavoring to retain funds for expansion. And in a dynamic capitalism the absolute income of active, and relatively small, new businesses may be nearly as large, and hence taxed at nearly as high a rate, as the income of older static firms. In the same way the beneficiary of a trust fund can well afford to pay three-fourths of his income in taxes. There may be "plenty"—as one often hears—left for him. But his income comes in year in and year out. Not so that of the active business or professional man. Furthermore, so far as inheritance and estate taxes are concerned, it may take a century to level down a large fortune—assuming even ordinary care in drawing of wills and preparation of trusts.[15] But very few new fortunes can be made. Our tax laws thus accomplish the distinguished result of making things easier for the second generation beneficiary than for the active founder—easier for the descendant than for the ancestor.

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[14] Butters and Lintner, *op. cit.;* Domar and Musgrave, *op. cit.;* Lerner, "Functional Finance," *op. cit.*

One conclusion indicated by this analysis is that we should explore the possibility of setting rates which would take into account the resources, as well as the income of the firm, and the individual. In the case of the individual, the earned income credit, now abolished, was a step, though a most inadequate step, in the right direction. In the case of a corporation, given two firms with equal income, the one with the smaller invested capital might be taxed at the lower rate.[16] In that way the two concerns would be put more nearly on an equality as far as ability to expand is concerned. Merely to state the problem, however, shows its difficulty, and it is doubtful if any administratively satisfactory method of doing the job could be found.

Suppose, however, that someone does discover a method by which income tax rates can be set to bear as heavily against the old firm and the established man as against the new. Would we then be justified in pushing up our rates to very high levels and carrying through a drastic redistribution program? The answer compels a consideration of the absolute price of enterprise.

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[15] There are two aspects of this case. First, on the legal side, an estate is taxed in general only once for each transfer. But even under the rule against perpetuities property may usually be tied up under one will for "Life or lives in being and twenty-one years thereafter." Thus, if the first beneficiary lives sixty years after the decedent's death—which is easily possible—the property will not pay another estate tax for *eighty-one years*. So much for the law.

Looking at the matter from the other side, however, I do not believe the average advocate of drastic redistribution has any idea of how easy it is to lose money. The world looks very different depending upon one's location in the income structure, and to those at the top the most impressive thing is the *rapid turnover* in the possession of outstanding fortunes. Yet here again, as Professor Simons and others point out, our liberal program has back-fired in the direction of making it easier to hold on to the capital of an estate. We have penalized risky and productive new investment (see text) and at the same time flooded the market with virtually riskless government securities.

[16] The fact that I have found it impossible to find an adequate accounting expression to convey my idea in this connection shows its administrative difficulty. I am indebted to Professor F. S. Kaulback of the University of Virginia for help in this regard.

Fashionable doctrine in recent years would have it that business men work chiefly for fun and prestige. They are said to bring home a profit as a hunter brings home a duck, and prospects of a very small one seem thought sufficient to induce pursuit of the chase on the windiest day.[17]

The writer does not deny the importance of the creative and prestige features. But there are other motives also. As Dr. Kenneth Boulding reminds us, the entrepreneur has not merely a choice between profit and loss.[18] He has a choice between action and non-action as well. In some cases a man may work harder with a high profit and income tax—in others not. The greater the extent to which the pleasures of leisure and cultivated hobbies are preferred, the more likely will the tax be to discourage entrepreneurial activity. Putting the argument at its lowest terms, it would seem evident that there would be, at the least, a margin of possible entrepreneurial action, concerning which income and inheritance-tax laws, by making it more difficult to transmit an estate, cast the balance in favor of leisure.

Recurring to the hunting example, it might well be asked if a professional hunter would bring in quite so many ducks if he knew that nine of every ten would be taken away? And the writer submits that the "steadiest" capitalist motives have been as follows: The corporation still in the active expanding stage is more interested in retaining earnings to pay off debts and expand operations than in paying out dividends. The usual capitalist individual is more interested in the accumulation of a fortune than in the enjoyment of income. Furthermore, he is interested in the accumulation of a fortune largely to *transmit* it to his children.

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[17] J. M. Keynes, *The General Theory of Employment, Interest and Money*, New York, 1936, p. 376; Wright, "The Future of Keynesian Economics," *op. cit.*, pp. 301–302.

[18] Boulding, "The Incidence of a Profits Tax," *loc. cit.*

We might perhaps, by appropriate modifications of income tax law, give the new corporation a fairer chance to accumulate capital. This might take care of the first problem. But still there would remain the problem of *personal* incentive, and we are too apt to forget that enterprises are initiated and corporations managed by *people*. No corporation ever did anything. The people in a corporation do whatever it does. If they have no incentive to act as good corporate officers, the corporation has no incentive. So far as the professions go there can be little question that the income tax has had serious effects on incentive. Why not the profession of being an executive? The real basis in the minds of many people for income and inheritance taxes is ethical dislike of capitalist incentives. Such hostility may be valid, but it is not honest to present as reform what is in fact, considering the magnitude of the changes envisaged, revolution.

IV. CONDITIONS OF DEMOCRATIC PROGRESS

Our modern equalitarian movement is a blend of many forces. Some of them are among the noblest aspirations of mankind. Others are not. Nearly two centuries ago Dr. Johnson declaimed against the ideal of equality of opportunity. He argued that permitting ambition in everyone would greatly increase unhappiness —for only a few could be at the top in any generation. Following this line, it could be maintained that the idea of relatively equal *opportunity* is a self-defeating one. The more nearly it is attained the less will those who do not rise be prepared to admit the inevitable implication regarding themselves, and the more fiercely will they try to blame their personal failures upon "the system." Furthermore, since absolute perfection in this, as in other goals, is never attainable, one will always find some degree of justified grievance upon which to rationalize. We receive, therefore, relatively little opposition when we speak of income tax reforms to "encourage competition," but if we mention inequality as an incentive we arouse all the equalitarian prejudices of the age. The basic problem lies in the fact that possession and transmission of some *relative* advantage is part of the *absolute* incentive. We can never overcome this entirely. The solution—in so far as there is a solution—is (a) state outlay for the less favored, financed by taxation more proportional than progressive; and (b) preservation of enough competition to keep the social structure adequately fluid.

The real issue is stated by Professor Pigou: "After all it may be argued [that] the real income that [the descendants] consume might not have come into existence at all unless their ancestors, for the purpose of enabling them to consume it, had made special efforts to work and save, and so helped to build up productive equipment. *It is the moral* not the economic evil that repels." [19] Yet it seems scarcely justified to speak as Tawney and Pigou do of the wasteful consumption of the rich as a major problem. Any responsible statistician can show what a small fraction the consumption of the wealthy is either of total output, or the demands of the poor. Income passed on to descendants may be a very small part of the total addition to net social product derived from capitalist incentives. A sounder view is that of Lord Keynes: "The rich were allowed to call the . . . cake theirs on the tacit underlying condition that they consumed very little of it." [20]

Again Mr. Tawney writes, "The more anxiously . . . society endeavors to secure equality of consideration . . . the greater will be the differentiation of treatment, which, when once their common human needs have been met, it accords to the special needs of different groups and individuals." [21] But if, as our argument would imply, the imposition of drastic equalitarian taxation greatly impairs the adaptability and sensitiveness of the exchange mechanism, then Tawney's conclusion would by no means follow. If the argument of Section II be accepted, and if we believe that technical progress has at all helped the poor, then there is perpetual conflict between the extent to which we may pursue equality today, and the extent to which we may hope for greater output tomorrow.

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[19] A. C. Pigou, *Socialism versus Capitalism,* The Macmillan Company, 1937, p. 16. Reprinted by permission.

[20] J. M. Keynes, *Economic Consequences of the Peace,* London, 1920, p. 20.

[21] Tawney, *op. cit.,* p. 39. Reprinted by permission.

The clue to social progress, it is submitted, lies not in abolishing the competitive game, or even in removing income incentives, but in improving the rules by education of the players. Putting the matter in a somewhat Chinese way, betterment comes by inculcating an increasingly humane code of competitive "good manners." As one does not seek to win a tennis match by hitting one's opponent over the head, so we obtain progress by making it "bad form" to get rich in such ways as sweated child labor. Not the end of competitive acquisition should be our aim, but the competitive acquisition of better things in a better way—the inculcation of higher aesthetic and ethical values.

Democratic progress comes through the existence and effect of an active censor class. This class in America may be roughly identified with the intelligentsia, and its long-run influence has been immense. Increasingly, however, the intellectual is forsaking his critical function for active political intervention and his excuse is that it is capitalism which creates the Philistine. The writer agrees with such men in their stress upon the importance of the aesthetic. He has an equal dislike for the hasty vulgarity of much modern life, but he believes that the roots of Philistinism, in our society, go far beyond mere capitalism.

As an economist, it may appear impertinent to list the philosophic currents, often mutually contradictory yet all potent, which underlie the ugliness of the modern attitude. But a few must be briefly mentioned. There is nineteenth-century scientific materialism with its implied denial of value, both aesthetic and otherwise. There is the survival of the fittest in the sense of a blanket endorsement of whatever comes out on top. There is endurance or continuity as the highest value. And finally there is the perversion of democracy into literal equality—equally ugly taste, equally bad grammar, equally sleazy ideas. If such attitudes are carried over into the planned state, the planned state will be a little Hell.

[redacted]

If they can be combatted in the capitalist state, we can get a social system as different from what we know as may well be imagined.

To give a merely economic or political expression to the justified alarm of the American cultural elite is extraordinarily superficial. The censor class in attempting to seize power and force reform and good taste have forgotten the "great refusal" upon which democracy is based. The fundamental method of democratic progress must be persuasion.[22] In the end, I believe, the intellectuals who destroy business competition in the name of redistribution, security, and planning, because they hate Main Street, will find that they have destroyed the very diffusion of power which protected them from Main Street.

We economists, despite frequent delusions to the contrary, are not on the advance firing line of the cultural battle. The basic problem of democratic progress lies in maintaining an ethical and aesthetic, as well as economic, pattern which is open, but not too open—a class willing to teach but also willing to accept a limitation of power—a people willing to listen. Whether so delicate a balance of forces can survive is *the* problem, but not our problem. We can, as economists, do little more than analyze the social environment in which the struggle may take place. But if the reasoning given so far is followed, it will be seen why the writer has so stressed the restrictive aspects of redistribution, and why it should be suggested that we should put greater emphasis upon other methods of maintaining social democracy than income redistribution.

First our progress requires active and constant social criticism. But following that, and returning to more technical economic matters, the broad lines of policy which would be indicated by this essay run somewhat as follows: An attempt should be made to equalize the burden of income taxation so that it will no longer discriminate against active entrepreneurial elements. Next, some equalization of income may be sought, provided an adequate absolute incentive is permitted.[23] Next, broad social services in the realm of health and education are needed. These are essential and inevitably involve a degree of progression. Next we should make an effort to remove those obstacles to investment at home and abroad which underlie the present theory of secular stagnation. Finally the writer suggests that greater equality of opportunity requires combination of anti-trust policy with credit facilities for small new enterprise.

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[22] Cf. Mr. Justice Jackson: *West Virginia Board of Education* v. *Barnette*, 319 U.S. 624.

The danger of the last suggestion, however, is that it is apt to become confused with ideas of feudal status and comprehensive *ex-ante* industrial planning and control. When a "little business" man leases his plant from a government bureau, and gets a loan from a government bank, *under* loan and lease terms which compel him to submit to comprehensive wage, price, and production control, such a man is scarcely the independent industrial pioneer we are looking for. This is especially the case if he also pays taxes which prevent him from adequate expansion with internal funds. He is no more than a foreman, or hired manager for the government, who is allowed to flatter himself by saying he "owns" the plant. Survival of a few limited property rights is not survival of capitalism. Our aim should be not so much to prevent size *per se* as too concentrated a frequency distribution.

Still another, and most important, aspect of more equal individual opportunity concerns the prevention of severe deflation. For deflation is the frequent mother of monopoly, and, unless it is kept within adequate bounds, the newer and weaker firms will be wiped out. Finally, equality of opportunity requires that wage policy pay more attention to the position of the marginal firm.

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[23] Professor Pigou, *op. cit.*, p. 118, quotes Carver as follows: "After one's accumulation has increased beyond that which is necessary to safeguard one's offspring and to provide for the *genuine prosperity* of one's family, the motive to further accumulation changes. One then engages in business enterprise because of a love of action and love of power." (Italics added.) But all this is purely relative. What is "enough" for the "genuine prosperity" of one's family? Professor F. D. Graham suggests $10,000 a year as a limit on inherited income. But seventy years ago that would have seemed enormous, and should our national income rise seventy years from now, it might seem trivial. We must look at these matters from a longer time dimension. It remains to be seen whether we can go very far in limiting the size of the trees without retarding the growth of the forest.

The policy sketched does not have the systematic appeal of more rigid systems. Further it contains a danger of being mistaken for other measures quite alien to it in spirit. Vigilance is still the price of liberty—especially when we try to combine relative security with it as well. Stress on over-all *ex-ante* planning of all industry, rather than mere compensating and supplementary state action, tends to destroy that independent access to the top which is so important. Wage policy which either destroys the small firm or leaves it dependent upon government subsidy (and hence politically and technologically subservient) is an important force toward monopoly. And finally an uncritical acceptance of literal equality of income as a positive goal, and a preference for state action upon all occasions, will leave the regime of "guided capitalism" devoid of vitality, or excuse, and ripe for extinction.

It may be objected that this is the "trend" and why should one question it? But for myself I do not believe that political democracy can long survive the end of competitive capitalism, and it does not seem right to me to compound with a trend, however apparently overwhelming, which one regards as essentially evil. After all, if one is to surrender always to the trend, it has not been very long since the apparently overwhelming trend was toward immediate fascism. I am quite willing to admit that the Western world is in danger of heading for decay—but I do not see why I should be asked to call the same movement a step toward Heaven.

II

Opposition to Deficit Spending for the Prevention of Unemployment

BY

SIDNEY S. ALEXANDER

I. THE PROBLEM AND METHOD OF APPROACH

THE THEORY supporting deficit spending for the prevention of unemployment is that widespread unemployment arises from a deficiency in aggregate demand. Deficit spending by government, financed by the creation of credit, then works toward the alleviation of unemployment not only through the direct employment of workers for producing the objects of government expenditure, but also through the secondary or multiplier effects of the additional expenditures of those who receive payment from the government in the first instance.[1] The deficit spending theory has associated with it an important assumption of fact, namely, that under normal conditions in advanced countries, especially the United States, present relations of productive capacity and income distribution would lead, if full employment were achieved, to a tendency for savings of individuals and corporations to exceed expenditures of individuals and corporations from sources other than income. Under these conditions full employment cannot be expected unless a government deficit makes up the difference.

If this theory and these facts are true it would certainly seem to be in the interest of all concerned for the government to ensure full

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[1] Actually some stimulation of employment is to be expected from increased government spending, even if financed out of taxation, but this is a finer point which need not concern the argument here.

employment by the appropriate amount of deficit spending when necessary. The fact that an important segment of our society is vehemently opposed to deficit spending as a cure for unemployment must then require some explanation. It is especially important to determine the basic attitudes and beliefs on which opposition to deficit spending rests, so that it may be possible to judge whether or not this opposition may be overcome in the future, either by education and propaganda on the one hand, or by the impact of the brute fact of depression on the other.

In considering the opposition to deficit spending, it is not proposed here to evaluate the merits of the arguments advanced on either side, since it is by now clear that many of the arguments are merely rationalizations of attitudes based on the economic or social position of the person concerned. It is fairly obvious that the lines between protagonists and antagonists in the majority of cases follow lines of class or political stratification. Broadly speaking, business men and conservatives are against deficit spending, trade unionists and liberals are for deficit spending. The main focus of our problem is accordingly why business men and those politicians who represent the business man's point of view are opposed to deficit spending as a means for preventing unemployment, even though according to the deficit spending theory the business man would presumably be better off under deficit spending.

In the following discussion it is assumed that the deficit spending theory is valid, and that unemployment, otherwise inevitable, can be avoided by a government program of deficit spending. Opposition in this case may be based first of all on misunderstanding. It may not be realized by the average business man that deficit spending can prevent unemployment, or that unemployment is inevitable without deficit spending.

Alternatively, even though it is realized that deficit spending is necessary for the achievement of full employment, there may be good reasons for business men to dislike full employment. They may particularly fear the deterioration in the discipline of the working force that comes about as a result of full employment. Similarly, with full employment the bargaining power of labor can be expected to improve so that there may be adverse effects of full employment upon the share of the employer in the total product. In short, business men may be interested in the maintenance of a pool of unemployed in order to protect worker discipline and to prevent wage rises. We may refer to this possibility as the "industrial reserve army" basis of opposition to deficit financing.

Another possible basis for opposition derives from the class aspect of the deficit financing program. Deficit financing first gained prominence in this country as a means of curing unemployment as part of the New Deal, which also contained broad measures favoring the economic status of industrial workers and farmers. In general, full employment programs, and especially those based on deficit financing, have been most closely identified with the interests of the urban proletariat, so that some of the opposition may be explained by this identification. This we may call the "class antagonism" aspect of opposition to deficit financing.

Finally, and certainly very important, is the fear of increasing state power that is associated, at least in the minds of business men, with government action to relieve unemployment, especially if that action takes the form of deficit spending. This fear leads to the vigorous defense of the free private enterprise system against the threats of statism, socialism, totalitarianism, and deficit spending.

We shall consider each of these four possible bases of opposition in turn: (1) misunderstanding; (2) industrial reserve army; (3) class antagonism; (4) fear of increasing power of the state. Each of these attitudes will be examined in order to evaluate its actual importance as a basic of opposition and to judge the probability that it may be changed in the future.

II. THE FULL EMPLOYMENT BILL

The analysis is based principally on the arguments and attitudes displayed in the public controversy centering around the proposed

Full Employment Bill of 1945 which became the Employment Act of 1946.[2] The essential features of the original bill were: (1) A forthright declaration of policy affirming the fostering of free enterprise, the right to work, and the responsibility of the U.S. Government to assure opportunity for full employment, first by stimulating private and non-Federal investment and expenditure, and then by providing such volume of Federal investment and expenditure as may be necessary for full employment. (2) A provision for a National Budget to be submitted by the President to each regular session of Congress. The National Budget was to contain estimates, for the next fiscal year or longer, of the labor force, of the volume of total investment and expenditure required to keep that labor force employed, and of the expected total investment and expenditure from all sources private and public. If a deficiency of total expenditure and investment below that required for full employment was expected, the President was to propose measures for stimulating private investment and expenditure. If this stimulation could not be expected to make up the deficiency, the President was to propose increased Federal investments and expenditure to bring the expected total up to that level required for full employment.[3]

The bill did not itself provide for deficit financing, but in essence directed the President to propose increased government expenditure and investment when required for full employment, and this could reasonably be expected to involve deficit spending. But the term "deficit spending" is so unpopular politically that the proponents of the bill hotly denied that it was based on the theory of deficit spending. In fact the history of the bill presents a fine example of a semantic stalemate. The supporters of the bill dared not come out point-blank for deficit spending because the term is too offensive to the general mores. But on the other hand the enemies of the bill could not very well go on record as opposing a measure entitled a "Full Employment Act." The Employment Act of 1946 as finally passed accurately reflects the working out of this dilemma. The Act was a manifesto and the Congress was not willing, under the conditions of employment and public opinion of February 1946, to sign so vigorous a manifesto as was contained in the original bill. The great scare about immediate post-war unemployment had considerably subsided by February 1946, but at an earlier date—September 1945—when the fear of immediate post-war unemployment was still strong, the Senate did pass by a vote of 71 to 10 a version of the Full Employment Act, which, though considerably modified from the original bill, still preserved the main framework.[4] It contained the words "investment" and "expenditure," "full," "assure," and for "right to employment" substituted the weaker though still vigorous phrase "are entitled to an opportunity for . . . employment." The near unanimity in the passage of the bill in the Senate was obtained principally by two qualifications. The first was that Federal responsibility and action for full employment should be "consistent with the needs and obligations of the Federal Government and other essential considerations of national policy."[5] The second was that any program for Federal investment and expenditure for the fiscal year 1948 or after, in peacetime, should be accompanied by a tax program over a reasonable period of years such that there would be no net increase in the national debt. In short, the deficit financing was to be compensated by surpluses in subsequent years.

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[2] An account of the early history of the measure up to its consideration by the Senate Banking and Currency Committee starting July 30, 1945 can be found in *Hearings before a Subcommittee of the Committee on Banking and Currency*, United States Senate, Seventy-Ninth Congress, First Session, on S. 380, Washington, 1945, pp. 10–17. This volume is hereafter referred to as Senate Hearings. Further public discussion of the Full Employment Bill is to be found in *Hearings before the Committee on Expenditures in the Executive Departments*, House of Representatives, Seventy-Ninth Congress, First Session, on H.R. 2202, Washington, 1945. This volume will be referred to as House Hearings.

[3] There were also inverse measures in case an inflation threatened, but those do not concern us here.

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[4] House Hearings, pp. 4-7.

[5] S. 380, Section 2d (4), reprinted in House Hearings, p. 5.

An employment act was finally passed, but one completely purged of the fighting words: "investment and expenditure,"[6] as in "such Federal investment and expenditure as will be sufficient to bring the aggregate volume of investment and expenditure by [all sources] up to the level required to assure a full employment volume of production"; "full," as in "full employment"; "guarantee" and "assure," as in "assure or guarantee the existence of employment opportunities"; "right," as in "the right to employment."[7]

Nevertheless, the Act as passed permits the President to do anything that the original bill directed him to do. In fact, the opponents of the original bill were fond of insisting that there was nothing in that bill that the President could not already do without the bill. Although the Act as passed is no weaker than the original bill in the powers it gives to the President, it is weaker in the language it uses and in the remedies it suggests. The importance of passing a bill was to put the government on record as taking responsibility for the prevention of employment, using deficit spending if necessary. The language of the Act, although qualified, does put the government on record as responsible to do *something* about unemployment. With a given Congress and a given President, the program that will be suggested in the President's Economic Report and the resulting program adopted by Congress cannot be expected to be different from the corresponding programs that would be forthcoming under the National Budget as originally specified.

The fact that the bill went through several stages of amendment and attenuation before it was passed served as an experiment to determine the critical point at which opposition turns into acquiescence. The following analysis of the various possible bases of opposition derives most of its materials from the controversy centering around the measure in its various forms.

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[6] Cf. S. 380 (original draft), Section 3c, reprinted in Senate Hearings, p. 7.

[7] The House representative on the joint conference which composed the final text of the bill boasted of these verbal purges in his report to the House. Congressional Record, Seventy-ninth Congress, Second Session, p. 944.

III. MISUNDERSTANDING

The most obvious explanation of the paradox that business men and others are opposed to deficit spending even though it is in fact good for them is that they do not understand the situation. This misunderstanding may be buttressed by a set of attitudes derived from the rules of personal finance that are inapplicable to government. We may call such an extension of individual standards to government finance the anthropomorphic fallacy. A somewhat more sophisticated type of disagreement arises from a rejection of the premise on which the theory of deficit spending is based. It is contended that our economic system, especially if the government would only leave it alone, would have a natural tendency to approach a state of full employment. An even more sophisticated type of opposition arises from the acceptance of the premise that unemployment is likely, but the rejection of the argument that deficit spending is the cure. We may term these bases of opposition rejection of the premise and rejection of the argument respectively.

By far the most widespread popular opposition to the theory of deficit spending arises from the extension to the government of the canons of sound personal finance. So universal is this attitude that it is not usually necessary to make the argument explicit. Merely to state that a particular measure will increase the national debt is to castigate it, and make it politically difficult to support. This is the reason for the oft-repeated denial by the supporters of the Full Employment Bill that it was a deficit spending measure. The opponents were fond of quoting Franklin D. Roosevelt to the effect that "the credit of the family depends chiefly on whether that family is living within its income, and that is equally true of the Nation." [8]

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[8] Franklin D. Roosevelt, speech at Pittsburgh, Pa., 1933, quoted by Rep. Woodruff in Congressional Record, Jan. 25, 1946. Other examples are: "For individuals and for government, thrift is the best policy." (John D. Rockefeller, quoted in *Reader's Digest,* Jan., 1945, p. 41.) "The national debt is a burden of over two thousand dollars on every man, woman and child in America. Deficit

Universal as is the appeal of the anthropomorphic argument, it must be discounted as a long-run basis of opposition to deficit spending. It can, however, be expected to persist as an auxiliary prejudice whose retention is convenient for those who oppose deficit spending for other reasons. It will also long constitute one of the strongest semantic weapons of the enemies of deficit spending in their appeal to the general public.

The economist's rejection of the anthropomorphic fallacy as a fundamental ground for opposition is based on the ease with which this fallacy is overcome on the part either of disinterested individuals or those who can especially expect to benefit from full employment brought about by deficit spending. It is not in general true that liberals are spendthrifts and conservatives are thrifty, but rather that the former have come to draw a distinction between government debt and individual debt, and the latter still find it convenient not to do so. It is no more likely that the anthropomorphic fallacy will yield before the Keynesian truth, than it was for the protectionist fallacy to have yielded before the truth of the Manchester school. To the degree that the fallacy does support other, better-founded attitudes it may be expected to persist. It accordingly has little independent significance, even though it will live on where its acceptance is derived from more fundamental attitudes.

It was almost uniformly charged by the opponents of the Full Employment Bill that it reflected a lack of confidence in the American system of free private enterprise.[9] This implies, on the part of the opponents of the bill, confidence in the ability of our economic system to function without serious unemployment—an attitude which, of course, requires considerable reconciliation

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spending puts further burdens on unborn generations." "I can't spend my way to prosperity., you can't do it, and Uncle Sam can't do it." "Hard work and production make for wealth and prosperity, and not the handing out of borrowed money by the government."

[9] See especially the testimony of Ira Mosher, President, National Association of Manufacturers, Senate Hearings, pp. 460 *et seq.*, House Hearings, pp. 573 *et seq.* See also statements of twenty-five State Chambers of Commerce, House Hearings, pp. 445–457.

with the occurrence of previous depressions. The reconciliation was most frequently made by the addition of the qualification "if the government only leaves business alone." In fact, the most typical attitude taken by the representatives of business, testifying concerning the Full Employment Bill, was that if government really wanted full employment it would create an atmosphere in which business could go ahead. This "atmospheric" theory of government relations with business particularly stressed "economies in government operations, reduction of taxes, elimination of regimentation, with encouragement of business enterprises large and small." [10] President Mosher of the National Association of Manufacturers indicated that only three developments can bring prosperity to a halt: (1) "Mismanagement of the money and credit system . . ." (2) "Granting or perpetuation of special privileges . . ." (3) "Prevention of an adequate flow of capital into productive, job-making activities." [11] Freely translated, the first point is a demand for sound money, the second for amendment of the Wagner Act in order to put greater responsibility on trade unions. The third point might seem to leave some room for the theory of deficit spending, but Mr. Mosher means by it principally the unfavorable effect of taxation on investment.[12] All three of these possibilities are thus ways in which ill-advised governmental policies can adversely affect business. In its most prevalent form, then, the rejection of the premise is part of a broader argument against government interference with business. It can therefore most appropriately be considered in Part VI below, where fear of the increasing power of the state is discussed.

In response to the question of whether the atmosphere for business was not satisfactory in the period immediately preceding 1929, the opponents of deficit spending would frequently abandon the rejection of the premise, or would modify the atmospheric theory. When the rejection of the premise was abandoned, the argument was usually advanced that "certainly, you can have full employment under a totalitarian system, but not under a system of free private enterprise," and "unemployment is the price we pay for freedom." [13] The alternative was to modify the atmospheric theory of government relations to business to the extent of blaming the depression of the thirties not so much on government policy as on particular maladjustments not curable by deficit spending. The first way out again leads to the subject matter of VI, namely, the fear of increasing the power of the state. The second alternative is in essence a rejection of the argument rather than of the premise, and will be considered under that heading.

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[10] Statement by Robert B. Heppenstall, President, Pennsylvania State Chamber of Commerce, House Hearings, p. 454.

[11] House Hearings, p. 548. This argument was included verbatim in the 1947 policy statement of the NAM. See *New York Times*, Dec. 8, 1946, p. 9.

[12] As indicated in detail in his testimony, House Hearings, pp. 550–551.

A rather curious attitude is often evinced when an opponent of deficit spending theory is forced to accept the premise of the prospect of unemployment. He frequently then states a strong preference for unemployment relief rather than government investment and expenditure for goods and services. This attitude was so general among opponents of the Full Employment Bill that it must be attributed to a fundamental premise of their opposition. It is probably related to class antagonism, the industrial reserve army, and fear of government power, discussed below.

Since rejection of the premise is a question of fact, can it not be expected that further experience, say of the next depression, will transform this attitude into a recognition of the desirability of deficit spending? In short, is this not merely an example of cultural lag, with the adjustment inevitable but delayed? The greater willingness of British business men to accept a full employment program may be cited as evidence in the affirmative. The only notable degree of acceptance of the deficit spending theory by American business men is among retail trading establishments, especially small ones. Even here the acceptance is far from universal. The most conspicuous business group which has acknowledged the tendency of the economic system to be subject to unemployment for lack of sufficient investment, and has not ascribed that lack of investment entirely to the adverse influence of government policies on business, is the Committee for Economic Development. In this case the immediate reaction is to reaffirm business' ultimate ability to ensure full employment, but to stress the fact that a conscious and coordinated effort in that direction is necessary. Should this effort on the part of business men prove insufficient to maintain full employment, it is at least somewhat doubtful whether there will be a large scale conversion of the business men with CED to the support of government deficit spending. Rather it is more likely that the impact of continued unemployment on the "enlightened" members of the business community will be to push them further toward a rejection of the argument, a direction already taken by some of their spokesmen who are most conversant with the study of economics.

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[13] See, for example, Virgil Jordan, *Full Employment and Freedom in America,* New York, Controllers Institute of America, 1945.

By far the most common form of rejection of the argument that deficit spending can cure unemployment has already been given in the section on the anthropomorphic fallacy: neither an individual nor a government can spend his way to prosperity. Another type of rejection arises from a misinterpretation of the argument.

Chairman Manasco of the House Committee on Expenditures in the Executive Departments never tired of asking witnesses whether they thought that if the unemployed numbered eight million the Federal government could long continue to pay them each two to three thousand dollars a year.[14] Oddly enough, nobody ever replied to him with a statement of the theory of the multiplier. In view of the rather technical nature of the theory of deficit spending, it is not surprising that many of its opponents should think of it as implying that the government hires all of the unemployed. The ignoring of secondary effects is especially likely when the pump-priming theory is denied, even by those supporting deficit spending. When secondary employment effects are ignored, and a dole is assumed, deficit spending is regarded as a method of taking away from those who produce to give to those who don't. This process, it is held, does not increase the real national income, because work and not deficit spending does that. This particular attitude may have been especially important in affecting the fate of the Full Employment Bill in the House of Representatives, but it is not likely to have much general significance for the future development of attitudes toward deficit spending. It should rather be considered as an appeal to the anthropomorphic fallacy, whereby ignoring of secondary effects permits the use of a larger and more intimidating figure for the growth of the national debt.

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[14] House Hearings, pp. 70, 513, 535, 559, 595, 751, and elsewhere.

A more significant type of rejection of the argument, though possibly less important politically in the recent past, is the contention that deficit spending is not a panacea. This position is taken by business men and their representatives who are rather sophisticated students of economics, and it is the most frequent attitude of professional economists who oppose deficit spending. It was probably given fullest expression by George Terborgh: "We do not question that compensatory fiscal policy may provide at times a useful, and even necessary measure of contracyclical action . . . It would be the grossest self-deception, however, to think that we have at present either the knowledge, the experience, or the institutional mechanisms to apply this weapon in a closely controlled and scientific manner. To conceive of this device as a simple and all-sufficient mechanical solution for our economic ills is simply naive." "Since this idea is a delusion, if we are to maintain a free economy, talk of a right to a job, unless discounted simply as demagogic eyewash, is cruel deception." [15] The line of argument is that unemployment is the result of a number of things, and deficit spending can't overcome many of these things.

Since Mr. Terborgh's position is based on a very high degree of economic competence, it may be taken as the most likely direction in which the attitudes of business men will move under the impact either of education by propaganda or of education by hard knocks in the next depression. In Mr. Terborgh's case this attitude led to a recommendation for a full employment bill with exactly those features that were finally enacted in the Employment Act of 1946.[16] It may accordingly be concluded that a good deal more education of the business man, even by the experience of another depression, may not convert him to the theory of deficit spending for the relief of unemployment.

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[15] George Terborgh, *The Bogey of Economic Maturity*, quoted in House Hearings, p. 604, and Terborgh's testimony, p. 607.

Rejection of the argument on rational grounds characterized the reception of Keynesian doctrines among economists, but after further discussion this yielded to a broad measure of acceptance. Business men are not so likely to change their views in a similar manner since their opposition is probably based upon more deeply seated grounds than rational analysis of the theory. In the quotation from Terborgh given above it is interesting to note that his denial of the notion that deficit spending will bring full employment is qualified by the reservation "if we are to maintain a free economy." It may be inferred that more fundamental than the rational rejection of the argument is the businessman's fear of growing state power discussed below.

IV. INDUSTRIAL RESERVE ARMY

It is, of course, possible that deficit spending as a means of achieving full employment is opposed because full employment itself is not desired. The supporters of the Full Employment Bill were quick to accuse their opponents of this motive.[17] The contention is that, under conditions of full employment, management has a difficult time keeping labor under its control and labor will be in a better position to get a larger share of the total product. Naturally no opponent of the Full Employment Bill put himself clearly on record as being against full employment, although an occasional remark may be so interpreted. It was very common, however, for enemies of the bill to deplore the effect of passage of the act upon the behavior of workers. An assurance of a right to a job, it was contended, would undermine the incentive to work and would disrupt the functioning of the economy. It is easy to see that this is consistent with a feeling that full employment may be too much of a good thing. There may well be a level of employment below full employment that brings maximum returns to the business man. A large number of the opponents of the Full Employment Bill believed that it would strengthen the feeling among the workers "that the world owes them a living, and through their government they will get it whether they work or not. There ought to be some fear of loss of job to influence this type of person." [18] The widespread preference, among the opponents of deficit spending, for a dole rather than public works is at least partially motivated by the desire to preserve worker discipline through fear of loss of the job. By making the receipt of government disbursements as socially degrading as possible, opponents of deficit spending hope to improve the bargaining strength of private employers.

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[16] House Hearings, pp. 613, 614.

[17] See, for example, statement by Representative Patman, Senate Hearings, p. 83.

It is not likely that the "industrial reserve army" basis of opposition will soften with time. The only question is whether, should it become obvious that a reasonable degree of prosperity can be maintained only by deficit spending, the self-interest of the employers may not better be served by supporting deficit spending, even though if carried very far it would adversely affect worker discipline from the point of view of the employer. Under these circumstances business men would want some deficit spending, but not too much.

Another attitude leading to opposition to full employment measures from dislike of full employment is associated with the "boom or bust" argument that we should avoid good times because they lead to bad. It is interesting to notice that the foremost theoretical economist who advocated the idea that business in the boom gets so good that it automatically becomes bad (Friedrich

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[18] Letter from R. H. Thompson to Senator Robert F. Wagner, reproduced in Senate Hearings, p. 1224.

Hayek) is also the intellectual leader of the opposition on the basis of the fear of growing state power. The boom-or-bust argument must, however, be regarded as a rather unimportant rationalization, since few of those who hold it would be actually willing, under conditions of less than full employment, to advocate measures that would make business worse (except for the curbing of speculation), in order to prevent the boom.

V. CLASS ANTAGONISM

Closely related to the industrial reserve army basis of opposition is the belief that deficit spending, or the Full Employment Bill, is class legislation. Deficit spending is closely associated with the New Deal and the great volume of social legislation enacted since 1933. It is supported by organized labor and New Dealers. The bi-partisan support for the Full Employment Bill indicates that there was some recognition of the widespread demand for the government to take responsibility for full employment. The opposition, however, and especially the die-hard opposition, closely identified the bill with labor rather than with the economy at large.

It is hard to say to what extent opposition depended on the intrinsic features of the bill and to what extent it depended on the quarters from which the bill derived support. Some members of Congress regarded the bill as a piece of class legislation, but many others recognized the breadth of public support for a full employment bill. Among business men public support carried less weight, and the New Dealism and labor-orientation of employment legislation was probably of greater importance. Business men's resentment was intensified by the feeling that employment legislation involves a cost that falls especially sharply on them in the form of taxes. The class antagonism attitude was usually expressed by simply tarring the Full Employment Bill as a New Deal measure, but more extreme forms of attack emphasized the effects on the redistribution of income, or raised the issue of whether the government should worry about full employment while the workers were creating unemployment through strikes. Thus:

"The legislation urged upon the Congress asserts that it is the 'responsibility of the Federal Government to provide such volume of Federal investment and expenditure as may be needed to assure continuing full employment.' Such pronouncement of governmental policy simply means that those who work and produce, and who consequently pay taxes and buy bonds, are to assume the responsibility to support those who fail or refuse to work and produce"; [19] and: "You cannot have continuous employment if, periodically, a large number of men who are employed in a particular plant will not work." [20]

It is difficult to predict whether the class antagonism basis of opposition to government spending will weaken in the future. Class antagonisms themselves, with the new strength of labor organizations, may be expected to increase, if anything. If the opponents of deficit spending were actually successful in achieving a continuously balanced budget, one could predict that the ensuing depression, which would be inevitable unless there were a permanent upward shift in the propensity to consume, would convert many business men to the realization that some deficit spending was desirable even from their own point of view. If, as is more likely, we have enough deficit spending in the future to maintain fairly high levels of production, with unemployment no worse than in 1936–39, opposition based on class antagonism is likely to persist.

VI. FEAR OF INCREASING STATE POWER

Next to the anthropomorphic fallacy, the most frequently expressed objection to deficit spending as a cure for unemployment is that it means the end of free private enterprise. This argument was also applied against the statement in the original Full Employment Bill that it is the policy of the United States to assure employment opportunities for all. The argument was seldom carried beyond the categorical statement that government responsibility for full employment means the end of free private enterprise. Few indeed were the supporters of the bill who attempted to show that the opponents meant by "free private enterprise" the control of the economic system by the managerial or entrepreneurial class, or the special privileges of the owners of property; even fewer were inclined to say, "so much the worse for free enterprise." The standard reply was that another depression might really mean the end of free private enterprise, and in making the economic system work they were saving free private enterprise.

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[19] Senator Moore of Oklahoma, Congressional Record, 79th Congress, 1st Session, p. 9224.

[20] Representative Hoffman of Michigan, House Hearings, p. 48.

Of course the high emotional value of the term "free private enterprise" in large measure explains the frequent appeal to this principle. In recognition of this semantic value the Full Employment Bill was studded with pleasant remarks about free private enterprise, and stress was laid on the fact that the President's economic program would first attempt the greatest possible stimulation of non-Federal expenditure and investment before resorting to Federal expenditure and investment. Business spokesmen were very little impressed by these features of the bill and generally passed right by them to press their attacks on the two key points of the bill: the assumption of government responsibility for employment opportunities, and the recommendation of deficit spending as a last resort. And here they raised the cry that free private enterprise was in danger.

Was this slogan adopted because it was the most effective political weapon to implement the opposition ultimately based on the factors previously considered, or was the fear of further extension of government responsibility itself a prime motivating factor? The latter seems to be the more accurate view. This interpretation, that the fear of growing state power is a genuinely independent attitude rather than being merely a slogan used to protect other interests, has considerable inferential evidence to support it.

Most significant in this respect are the alternatives suggested to the Full Employment Bill. The most common, and certainly the most characteristic, of the proposals of the business spokesmen ran in terms of freeing business from government regulation. In particular, more favorable taxation and fewer attempts at a planned economy came highest on the list of alternative programs advanced by business men. We may, accordingly, conclude that the business man's opposition to the extension of government influence on business is really a fundamental attitude rather than one derived from the other factors we are considering.

Just how fundamental it is remains to be determined. It is clear that to a certain extent opposition to government control of business can be derived from the profit motive; the business man wants the government out of business because he can make more money that way. This applies obviously to taxation and also to social legislation which frequently is felt by the businessman to restrict his profit-making possibilities. It applied especially powerfully to wartime price and production controls.

If the principal basis of the antagonism to government responsibility for employment were derived from the profit motive, then it could reasonably be expected to weaken in the future, on the assumption that deficit spending will be necessary for the maintenance of a high enough level of production to afford a satisfactory level of profits. There is no business opposition to those governmental activities that are clearly and positively associated with profits. Protected industries do not object to tariffs as violations of free private enterprise, and legislation strengthening government regulation of trade unions would certainly be welcomed by business men in general. This is consistent with the oft-encountered statement that it is the government's task to give business a favorable climate, but not to attempt to try to run business—the "atmospheric" theory of government's relationship to business.[21]

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[21] This theory was almost unanimously supported by the representatives of business men and other opponents of deficit spending and governmental responsibility. See statements of Ira Mosher, President, National Association of Manufacturers, House Hearings, p. 578; George Terborgh, Research Director, Machinery and Allied Products Institute, House Hearings, p. 602; Joseph W. Kane, representing the Chamber of Commerce, Detroit, Mich., House Hearings, p. 659; James L. Donnelly, Executive Vice-President, Illinois Manufacturers' Association, House Hearings, p. 708, to name only a few.

The distinction between government as a climate-maker and government as an interferer cannot be easily drawn, but the attitude which calls for this distinction is quite understandable. The business man does not want his position as helmsman challenged. It is he, the manager or the entrepreneur, who is the decision-maker; and he does not want that position usurped by the government. What he fears from greater governmental responsibility is not the road to serfdom but the road from suzerainty. The business man does have a fear of government activity independent of the profit motive; it is the fear of government as a competitor for economic power.

This attitude is probably well founded. The business spokesmen are fond of referring to business men as job-makers, but a general acceptance of government responsibility for employment clearly implies the transfer of this title to government. The reversal of the dictum "what's good for business is good for you" to "what's good for you is good for business" forebodes a revolution in the business man's place in society. To a certain extent that revolution has already taken place, as is evidenced by the importance of news from Washington in the weekly "business letter." The importance of governmental decisions for business affairs has grown, relative to the importance of business men's decisions, and business interests realize this keenly. Because they do realize it so keenly, they can be expected to be particularly sensitive to the danger of further encroachment; and the explicit recognition of government responsibility for full employment represents a large-scale encroachment. Opposition was all the more stimulated by the fact that the Full Employment Bill was only a manifesto. Even if the profit motive should lead business men to accept the fact of deficit spending, it would still be politically wise for them to delay the general acceptance of the theory.

The long-run development that can be expected is the atrophy of the entrepreneurial function. The primary role of the business man, as distinct from technical management, is to adjust the operations of his business to changing economic conditions. Gradually the situation is developing wherein governmental decisions in large measure *make* these economic conditions. With this development, the government official tends to displace the business man as the key decision-maker, and, with some lag, the business man's position in society will probably be readjusted downward in keeping with his economic function. He has already descended the verbal stairs from the rank of "Industry" through "Capital" to "Management." He may in fact as well as in name become "Management" rather than "Enterprise." The business man may personally avoid this degradation by taking over the government, but even in this case the government function will in the long run come to dominate so that he will be more government official than business man.

It should be noted that the analysis above does not depend on the alleged fact that if the government should take responsibility for full employment it would have to control more and more aspects of economic life in order to discharge the obligation. It is based on a theory of social development that even if the government could insure full employment in a manner that left the maximum amount of decision-making to business men, the fact that it was the government and not the business man that was fundamentally responsible for the level of economic activity would work toward the decline of the business man and the growth of government economic activity. For there would still exist other tendencies leading to increased government economic control, the most notable being the struggle between organized labor and the business man. The government is involved in settling the struggle, and the bargaining power of the business man is impaired if it is realized that not the business man but government is determining the level of economic activity. There is a broad understanding by the general public of the impotence of the business man to stem a recession. Consequently the voters already hold the federal administration rather than the business man responsible for the level of employment.

So when a business man opposes the deficit spending theory on the grounds that it means the end of free private enterprise, he is right in that it probably does imply the decline of the free private entrepreneur. Of course, the supporters of deficit spending are also right when they say that a prolonged repetition of 1933 conditions would also mean the end of free private enterprise, and business men realize this also. It is a fair guess that they will probably go along with whatever deficit spending is required to maintain a moderately prosperous condition—say no more than the 1937 level of unemployment—but they will not accept the theory of deficit spending. This conclusion also fits in with our evaluation of the industrial reserve army basis of opposition to deficit spending considered in Section IV above.

Since the business man's fear of increasing government power as a threat to his own sovereignty is, in the writer's opinion, well founded, it may be used as an aid in explaining the continued retention of the fallacies mentioned in Section III. The business man, according to his economic sophistication, appeals to the anthropomorphic fallacy, or rejects the premise of the argument, because to do otherwise is to drive a nail into his own coffin. Furthermore, it is now clear why business spokesmen so strongly prefer emphasis on public expenditure as a dole rather than as an instrument for the prevention of unemployment. The paying of a dole by the government does not challenge the business man's position, whereas government prevention of unemployment threatens the business man's position in the economy.

VII. THE OUTLOOK

It must be admitted that when extensive unemployment is upon us deficit spending will almost certainly be undertaken to relieve it. The next recession will not be marked, as was that after 1929, by a controversy as to whether the unemployed are to be the object of private charity or public relief, but public works are likely to be speedily, though perhaps haphazardly, undertaken.

These public works will most probably not involve direct government hiring of the unemployed but will be given out as contracts to private construction enterprises.[22]

The Full Employment Bill as introduced was important as a manifesto making explicit the government's responsibility for maintaining full employment. The weakened language of the final act represents a compromise between the public demand for the government's taking some responsibility and the public fear of continued increase of the national debt. It is not likely that the stronger form of the bill would have led to greater or prompter deficit spending when necessary in the future.

It is not likely that the theory of deficit spending will in the near future be embraced as an explicitly avowed policy of the Federal government, but the practice of deficit spending in depression can confidently be expected to continue. Business men's opposition to the practice may be expected to be weak under conditions of unemployment, but their opposition to explicit acceptance of the theory of deficit spending may be expected to continue. The most important single basis of opposition, and one which helps explain many of the other grounds of opposition, is the fact that government responsibility for ensuring full employment does imply a long-run decline of the importance of the business man.

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[22] The conclusions up to this point do not follow from the preceding paper but from impressions drawn from attitudes displayed in the controversy over the Full Employment Bill.

III

Dynamic Elements in a Full Employment Program

BY

HARVEY S. PERLOFF

THERE HAS been a tendency in some of the recent discussions of full employment to oversimplify the problem of achieving continuous full employment of our productive resources and to put excessive reliance on the annual equating of outlay with output, or what might be termed the fill-the-tank remedy. This limitation has even appeared in certain of the proposals and studies which mark significant advances along the full employment front, such as the Murray Full Employment Bill and some of the full employment models recently developed as tools of economic analysis. The major short-coming is that not enough scope is given for deliberate governmental action to *direct* the key dynamic forces in our economy. It is the thesis of this paper that only through such deliberate governmental measures can the objective of continuous full employment be achieved.

I. FAR, BUT NOT FAR ENOUGH

An examination of the more recent full employment proposals is helpful in clarifying the point at which such proposals fall short of providing the tools for achieving the goal set.

The Murray Bill

The Murray Full Employment Bill, as originally introduced and as reported by the Senate Banking and Currency Committee

(S. 380), was well conceived in most respects. It placed the responsibility squarely on the federal government "to assure continuing full employment." It specifically called for a National Production and Employment Budget (a prime necessity if we are to advance beyond the horse-and-buggy age of budgeting), for the coordination of federal economic policies, and for a carefully planned economic program which would, among other things—

> . . . to the extent that continuing full employment cannot otherwise be assured, provide such volume of Federal investment and expenditure as may be needed, in addition to the investment and expenditure by private enterprise, consumers, and State and local governments, to assure continuing full employment.

As conceived by the sponsors of the bill, the President, in the National Budget, would present estimates of full employment output, anticipated outlay, and the amount of federal investment and expenditure needed to fill the gap between the two.

This approach to the maintenance of full employment, which involves the equating of outlay with full employment output, indicates that a fundamental economic lesson has been learned (in some quarters, at least); namely, that, "in terms of time-period analysis, the community must return to the income stream in each period as much as it received in previous periods, or else there will ensue a cumulative downward spiral of income and employment." [1]

But although it was stated in the original bill that public investment and expenditure should be used to fill any "gap" that might appear, no provision was made—nor serious thought given to the concept—that public outlays should be employed to direct the forces of consumption, saving, and investment in such a way as to *narrow* or possibly *eliminate* the "gap" in the first place. The extensive hearings and debates on the bill made it clear that the sponsors, as well as the overwhelming majority of the supporters of the bill, among business, agriculture, labor, and other groups, accepted the concept of federal "full employment" outlays as *a residue.*[2]

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[1] Paul A. Samuelson in *Postwar Economic Problems,* edited by S. E. Harris, McGraw-Hill, 1943, p. 37. Reprinted by permission.

The main shortcoming then was that no provision was made for measures to bring about basic changes in economic relationships. Only if such changes are made, can a satisfactory solution to the full employment problem be found. What is required, among other things, is a certain minimum of long-range national, regional, and community planning, a clear-cut wage and price policy, and the strategic, continued use of public expenditure, taxation, and borrowing to lay the basis for continuous full employment. A "gap" may appear at times in a private-enterprise economy no matter how thoroughgoing the public programs may be, but such measures are necessary to ensure that at all times the gap is kept within manageable proportions.

The Murray bill, as finally passed by Congress in an emasculated form (under the title of "Employment Act of 1946"), retained certain of the desirable procedural measures, but set forth the objective in such vague form as to amount to little more than economic "general welfare" legislation. The act does not provide any specific measures for achieving continuous full employment (aside from the useful provision for the coordination of federal economic policies), but it might be *interpreted* as underlining the need for such specific measures if the responsibility of the Federal government ". . . to promote maximum employment production, and purchasing power," which it declares as national policy, is to be carried out. The big job of implementation remains to be done.

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[2] The relegation of federal outlays to the role of gap-filling can be explained in part by "political expediency," the desire to wrap oneself in the robe of financial orthodoxy when proclaiming a not-so-orthodox doctrine. But more important than the use of accepted symbols is the unmistakable evidence of the widespread acceptance of the theory that a strictly compensatory (residual) fiscal program is adequate to provide a sustained level of full employment. See *Hearings before a Subcommittee of the Committee on Banking and Currency*, United States Senate, on S. 380, 79th Congress, 1st Session.

Full Employment Models

The development of statistical models has contributed a great deal to the analysis of full employment problems. The technique involved is essentially one of estimating for a given year (1) the gross national product at full employment, the incomes therefrom, and the total expenditures by business, government, and consumers, and (2) the resulting gap between income and total outlay. Various methods of filling the gap are presented. Such studies make an important contribution by effectively demonstrating that a condition of full employment cannot be expected after the postwar transition period, if the economic relationships that existed between the wars will reoccur. There must be an increase in expenditures beyond the "trend" levels somewhere along the line—either by business, government, or consumers.

A shortcoming in analysis in most statistical models arises, however, from the limitations imposed by the fact that they are concerned only with describing static, short-run equilibrium conditions. Moreover, the emphasis on fiscal policy has so conditioned the selection of pertinent variables that the resulting models are not adaptable to the evaluation of the effectiveness of other policies, such as wage-price policies, credit policies, etc. The (model) system, by excluding these elements, implies either that it is invariant to changes in them, or that they can be assumed to be unimportant or constant. Discussion of these elements as an aside, as is sometimes done, does not increase the usefulness of the *model* as an analytical and planning tool.

What is needed is that the basic relationships and their interactions (through time) should be introduced into the system itself. Only thus can the relative effectiveness of the available economic weapons in meeting the full employment benchmarks be weighed, their timing considered, and inconsistent assumptions avoided.[3]

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[3] For example, the National Planning Association models ("National Budgets for Full Employment") permit a static view of the relationships between government outlays on the one side and consumption and business investment on the

A further danger of the tendency to forego analysis of "dynamics" is the emphasis on short-run stability. For example, the models do not consider the long-run effects of the various methods of filling the gap. Obviously, each of the methods will have a different effect on production, income, and employment. We cannot be content merely with filling the gap. An ill-considered choice among the methods available may result in there being a smaller product to distribute in later years.

Thus, the fact that an analysis of past economic relationships points to the necessity of raising consumption levels does not in itself justify the conclusion that the *entire* estimated gap should be filled with individual consumption.[4] Much thought should certainly be given to the advantages and possibilities of reaching the full potential of our productive power,[5] so that an acceptable standard of living can be achieved for everyone, and full use made of technological advances.

This points to the necessity of lifting the curtain of the aggregates, and making more detailed studies of the composition of such deceptive totals as construction, government expenditures, etc. A shift of emphasis in expenditures as to types of programs and projects—with significant difference in materials employed, relative payments to labor and capital, etc.—will give a different result from that anticipated from an historical-regression analysis treating aggregates.

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other. Thus, the "Business model," presented as one method of achieving full employment, shows an increase in investment, while the "Consumption model," as another method, shows an increase in individual consumption, with governmental outlays remaining at the estimated "trend" level in both cases. It might well be asked, however, whether, given the existing economic structure and relationships, it is possible to vary these components without involving significant changes in the governmental sector.

[4] Suppose the "Consumption model" is adopted; what would be the effect on total productivity in the following year and the years thereafter of increasing the relative importance of such industries as trade, services, food, furniture, and textile manufacture—industries in which output per man-hour has increased but little in the past generation—and a decline in the relative importance of such industries as iron and steel, machinery, petroleum and coal, and chemical manufacture, in which there have been rapid increases in productivity?

[5] See J. M. Keynes, *The General Theory of Employment, Interest, and Money*, Harcourt, Brace, 1936, p. 325.

The closing of the gap is necessary for full employment, but it is not sufficient, for the spending must also minimize distortions within the technological framework of the economy if instability is to be avoided.

Going the Whole Way

It seems both undesirable and impractical to represent limited programs as adequate to do the job of assuring continuous full employment. That is comparable to a physician suggesting that penicillin alone will cure any bodily ill. It is incumbent upon the economic doctor to analyze the economic ills, prescribe as permanent and complete a cure as possible, and specify how far short of full recovery the patient will fall if only part of the prescription is followed.

II. STRATEGIC FACTORS IN THE ECONOMY

This paper is concerned essentially with the question of *approach* to the development of an effective full employment program. To determine the elements which are basic to the construction of such a program, it is helpful to examine briefly the dominant forces and the significant relationships in our economy.

The Consumption-Saving Pattern

Economists would render the policy makers an invaluable service if they could state categorically the exact national consumption-income ratio most conducive to the maintenance of continuous full employment with continually rising standards of living. Unfortunately, this cannot be done, but enough is known about the nature of this relationship to lay the basis for a rational policy.

A glance backwards is useful here. We have been a nation of savers; individually, we have saved whenever we could; nationally, we have had net savings except in the very depth of the deepest depression. Especially pertinent is the fact that a considerable and stable percentage of national income has consistently been saved at fairly high levels of income. This points to the conclusion that, as Professor Hansen has put it, "as long as the current consumption-income pattern persists, the economy is geared to high investment." [6]

It would seem that custom, habit, and persistent institutional factors have determined within rather rigid limits the ratio of consumption to income. Corporate practices with respect to depreciation reserves and retained earnings, the volume of insurance savings (with large reserves being built up), and the relatively consistent proportions in the distribution of income are among the forces which have given stability to the consumption-saving function. Undoubtedly, the instability of the economic system, with its extreme fluctuations in national income, has strengthened the desire on the part of individuals and business organizations to save high percentages of income.

Since the deep depression years of the early thirties, the proportion of national-income-paid-out going to wages and salaries has gradually increased. This income-equalizing force, making for an increase in the consumption-income ratio, has been offset in part, however, by an increase in the concentration of the other components (entrepreneurial income, dividends, interest, etc.). On the other hand, available figures indicate that during the war years and since, the income tax has been increasingly effective in reducing the inequality of the income distribution. This is in sharp contrast with developments in the American system of public finance during the twenties and thirties when the redistributive effects of the progressive federal income tax were apparently more than offset by the weight of federal, state, and local taxes on the lower income groups.[7]

Unless there is a turn-about in current sentiment, it seems likely that the progressiveness of the tax system will suffer from a reduction in the federal income tax at the same time that consumption taxes remain at existing levels. The battle for a thoroughly progressive revenue structure is far from won.

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[6] *Fiscal Policy and Business Cycles*, New York, W. W. Norton & Co., 1941, p. 238.

[7] See Hansen and Perloff, *State and Local Finance in the National Economy*, New York, W. W. Norton & Co., 1944, Chap. 3.

Community consumption expenditures have increased relatively slowly in the United States and, in fact, increases at the Federal level during the thirties were largely offset by decreases in such expenditures by the state and local governments. Public outlays for education, health, and recreation have tended to remain, on the whole, at what might be termed traditional levels. Certainly, their level and scope to date have not been such as to raise permanently the propensity to consume of the nation.

Looking ahead, there are a number of factors which would seem to mitigate against any appreciable increase in the private consumption-to-income ratio in the near future, including: (1) the inflationary price rises to the transition (reconversion) period which press down the level of real wages; (2) the tendency on the part of corporations to retain a very large share of earnings, due in part, no doubt, to the extreme uncertainties of the post-transition period; (3) the newly formed saving habit of the lower income group; [8] (4) the change in spending habits.

Thus, both past and current developments point to the continuation of a high saving ratio—unless there is deliberate governmental action to raise the consumption function.

The Role of Investment

It has frequently been demonstrated that the maintenance of full employment in a capitalist economy, with an increasing labor force and labor productivity, requires a growing national income.

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[8] According to the Federal Reserve Board Liquid Assets Survey, almost half of those with an income of under $1,000 saved some of their income in 1945, with over a fifth of this group saving 20 per cent or more of their income, while over two-thirds of the $1,000–$3,000 income class saved part of their income in 1945. It can be expected that these groups will at least make an *attempt* to continue saving. People learned to conserve and to "do without" during the war. The Liquid Assets Survey reports that when asked their purpose in saving, most people mentioned "security" motives; "only one out of ten indicated that they were saving to purchase consumer durable goods or to make other consumption expenditures . . ." Americans today seem more concerned with securing their futures than with "keeping up with the Joneses."

In a highly dynamic economy, with a relatively stable saving-consumption pattern, the crucial factor is the rate of investment, with investment both generating income and increasing productive capacity.[9]

Employment must be treated not merely as a function of national income, but also as a function of the ratio of national income to productive capacity. Unless the marginal propensity to save declines or unless more capital is required per unit of output, it has been shown that the maintenance of full employment of productive resources in our economy requires investment to grow at a constant compound percentage rate.[10] The *rate* of growth is decisive. A study of the degree to which the growth of capital utilization in the United States has been correlated with the expansion of the national income shows that in the fifty years between 1878 and 1928, an increase of capital employed—i.e., "a net capital investment (including inventories), of about $320–$330 was associated on the average with an increase of $100 in the level of the net national income." [11]

We are left with the conclusion that, given the economic relationships which have persisted to date, the assurance of continuous full employment is dependent on a constantly rising national income, which, in turn, requires a large *continued* flow of net investment. In other words, we are in the same position as Alice's Red Queen—we have to "run fast."

It is important to note that autonomous, anticipatory investments, involving high rates of capital accumulation and engendering a vast network of underlying and supplementary industries, have played a leading role in our various periods of buoyant prosperity and in the secular increase of per capita real income. The rapid expansion in railroads from the middle 1840's to the decade of the seventies, the growth of the automobile, electric power, and telephone industries in the first three decades of this century, together with the opening of new territory and the almost rampant exploitation of new resources, combined to give us a highly dynamic economy which went ahead in spurts and bounds, but with sharp downward swings between the long sweeps of technological and innovational developments. In each case, the mere slowing down in the *rate* of growth of the key industries caused an absolute decline in the volume of new investment required in the plant and equipment of the subsidiary industries, such as iron and steel, petroleum, rubber, glass, and construction generally.

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[9] The decisive role of this factor has been underlined in the work of Alvin Hansen. See especially his *Fiscal Policy and Business Cycles*, New York, W. W. Norton & Co., 1941.

[10] For a development of this approach see E. D. Domar, "Capital Expansion, Rate of Growth and Employment," *Econometrica*, April 1946.

[11] H. Stern, "Capital Requirements in Progressive Economies," *Economica*, August 1945, pp. 163–71.

That raises two crucial questions: First, can we anticipate any new industries (or revolutionary industrial changes) to take up where the railroad and automobile industries left off, i.e., to act as superchargers of our economy? And, secondly, if they do appear, will that alone be adequate to provide continuous full employment?

It would take a fine crystal-ball to be able to answer the first question. It is possible, of course, that some giant new industry may appear or that we may experience a new industrial revolution—as predicted by some—which would involve a far-reaching renovation of industrial equipment and provide investment outlets for a long time to come. (The widespread application of atomic energy to industrial purposes, for example, may bring about such a development.) But there is no assurance that even with concerted private and governmental efforts in research such a new era of stupendous proportions will take place at all; and even if it does arrive, it may not come for another generation or more. Certainly, if continuous full employment is accepted as a prime social objective, complete reliance cannot be placed on a mere possibility.

There are additional factors in the economy which must be taken into consideration. Our industrial plant is highly developed, especially in the producers' goods field. The size of the latter has for some time now been geared to the demands of a rapidly expanding system for more machines and structures of all kinds, and recently to the even more rapidly expanding demand for implements of war. At the same time, the tendency for conservatism to accompany maturity on the part of the large semi-monopolistic, well-entrenched firms with ample internal funds has become of primary significance. Production for an assured middle-and-upper-income-class market, restriction of output, suppression of patents and innovational developments, and other familiar practices have come about not only through the search for monopoly profits, but for other objectives as well—including the desire to maintain their position in the market, to safeguard capital investment, to achieve independence of the capital market, and to minimize taxes. The tendency for conservatism and restriction has undoubtedly been intensified by the boom-and-bust pattern of the past. Thus, it is quite possible that it would take a *frequent* appearance of giant new industries, and possibly the appearance of several such industries at a time, to achieve a *rate* of capital growth adequate to maintain continuous full employment—given the existing consumption-saving pattern.

These considerations would seem to point to the conclusion that at the present time there is urgent need *both* to raise the consumption-income ratio of the nation (and, thereby, narrow to manageable proportions the margin to be filled by net investment), and at the same time to provide a "managed" *lever* to ensure a steady, increasing rate of real investment.

III. A MANY-PRONGED ATTACK

Raising Consumption

In an economy in which there is no serious danger of savings falling below the volume adequate to permit all the new investment which changes in technique make possible, but in which there is a persistent tendency for effective demand to fall short of the volume necessary to absorb the rapidly increasing products flowing from the technical progress, the emphasis must be on giving consumers sufficient purchasing power to raise their effective demand progressively.

We are involved in an unfortunate circle. Because of the limited and widely fluctuating income of the masses of the people, business concerns in large and important sectors of the economy tend to seek a fairly narrow, but relatively stable middle- and upper-income market, and price their products accordingly. But limited markets mean limited outlets for profitable investment, so that savings often lie idle and restrict the economy in generating income for the masses of the people. Unless we can assume that the major section of the business community will voluntarily change over to a low-price–mass-market policy, we must conclude that the circle can be broken only by deliberate governmental measures to raise the buying power of the lower income groups and the propensity to consume of the nation as a whole.

But the level of the consumption function cannot be shifted upward by merely dumping a certain amount of purchasing power into the system. As already pointed out, our consumption-saving pattern derives from long-standing custom and persistent institutional forces. Raising the consumption function will require a concerted attack along many fronts, including: (1) a change in the proportion of the various distributive shares in the national income, (2) redistribution of income through the tax system and social service expenditures, (3) provision for more adequate "security" in order to narrow that motive for saving, (4) increases in community consumption, and (5) elimination of as many monopolistic forms and practices as possible. We shall mention briefly some of the measures which would contribute to the ends sought.

Increase in Wage Share

In fostering an economically healthier balance between *distributive shares*, public policy might most effectively be directed toward:

(1) Maintaining a stable price level by the use of monetary and fiscal tools and price subsidies.

(2) Making a concerted and continuing attack on monopoly, restraint of trade, costly corporate superstructures, and administered prices. These forces are especially pernicious in reducing the real purchasing power of wage earners and other consumers, and in enhancing profits abnormally.

(3) Paying Federal, state, and local employees higher-living-standard wages and salaries. The public payroll was an important share of the nation's total payroll, even before the war, when more than four million workers were employed by Federal, state, and local governments, and the figure is much higher today. The wages and salaries of some of these groups are notoriously low. For example, the national average for grade school teachers in 1941–42 was only $1,366; rural school teachers' salaries averaged $1,018. The increase since then has lagged behind the general wage rate increase. In other fields, such as public health and public welfare, salaries are equally inadequate. A full-employment wage policy should be applied in the public sphere.

(4) Raising the level and extending the coverage of minimum wage provisions. This would require state as well as federal action, since a large proportion of the low-pay workers are in *intrastate* trade, services, and other industries. No doubt much of the gain made through the existing federal law has been dissipated by the inflationary price increases of the war and reconversion periods.

(5) Raising farm incomes by encouraging submarginal farmers to shift into trade, commerce, and industry, and by improving farm productivity and diversification through regional developments of the TVA type. If successful, such measures would help lift the level of farm wages and farm incomes generally, and would help lower the prices of farm products to consumers.

(6) Encouraging a rising wage-salary rate trend over the whole economy, and encouraging an extension of wage security. This is the most important item for achieving a higher consumption-income ratio, but at the same time it is the most difficult one.

However, the full potentialities of influencing the wage bargain in a free enterprise society have not yet been tapped. In particular, a great deal more can be done in research and education, and the required use of fact-finding boards in major labor disputes. This would preserve the essential bargaining freedoms, but would ensure that national economic interests would be given a hearing and public opinion would be brought to bear in achieving national policy.

Income Redistribution

Because of the rather definite limits to government activity in directing the proportion between various distributive shares, it is unlikely that the above-mentioned measures alone would provide the desired increase in the consumption-income ratio. A redistribution of income, therefore, would seem necessary. To achieve such a redistribution, the entire tax system, including the state and local structures, must be made progressive, since the primary consideration is the burden of taxes imposed by all levels of government taken collectively. Not only should there be greater reliance on the more progressive taxes (especially individual income and estate and inheritance taxes), but greater equality in the impact of the various taxes as well (through improved assessment, the plugging of income tax loopholes, and similar devices). The effects on investment of changes in the tax structure must, of course, be carefully considered and provision be made for adequate less-offsets.[12] To the extent that an economically sound tax structure contributes to the development of a system of continuous full employment, it helps to reduce risk itself, since under such a system losses due to cyclical fluctuations are minimized and steady markets are fostered.

Consideration should also be given to the fact that the various levels of government must, by their very nature, have different types of tax structures. Thus, for example, it is not feasible for local units to levy a progressive income tax; they must rely on more or less regressive-type taxes. It follows, therefore, that the relative shares of the total responsibility for financing public services assumed by the various levels of government will determine, in large part, the character of the over-all tax structure. The assumption by the Federal government of a larger share of the total financial responsibility (mostly through grants-in-aid) will itself increase the progressiveness of the total tax system. Certain basic changes in social security taxation are needed as well. Reserve accumulation should be discontinued and the proceeds of payroll taxes be supplemented out of general tax revenues.

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[12] For a discussion of the effects of taxation on investment in risky enterprises, see Evsey D. Domar and Richard A. Musgrave, "Proportional Income Taxation and Risk-taking," *Quarterly Journal of Economics*, May 1944, pp. 388–422. See also A. P. Lerner, "Functional Finance and the Federal Debt," *Social Research*, February 1943, pp. 45–46.

An increase in social service expenditures would also serve to effect a redistribution of income. The important element is *the relationship between taxes paid and benefits derived from governmental expenditures by the various income groups*. The objective is to increase the income of individuals and families who necessarily consume all or nearly all of their income. What is needed, in the first place, is a comprehensive system of social insurance and public assistance which would guarantee that at no time and under no circumstances would the income of any individual or family fall below a certain basic minimum. Increased outlays for education, health, recreation, and other community-consumption expenditures would fill an economic as well as an urgent social need by raising the over-all level of consumption in the economy. Careful study of this subject has indicated that the most fruitful approach is the Federal underwriting of minimum service standards (chiefly through "equalization grants" to states and localities), since the greatest need is precisely in those areas with the most limited financial resources.

A Dynamic Investment Lever

As already noted, there are strong reasons why a *sudden* shift to an *extremely high* level of consumption is both undesirable and unfeasible. The make-up of our economy makes it inevitable that for some time to come, at least, net investment must play an important role. But as long as there is no certainty that private net investment will be forthcoming in adequate volume and with sufficient regularity to provide continuous full employment of productive resources, we need a powerful, dynamic lever which will make for long-range full employment stabilization in a progressive economy. It is suggested that long-range development programs for every important river basin in the country (or on some other regional basis), and redevelopment programs for every urban community, can furnish the key to both stability and progress, by guaranteeing a *continuous* rate of capital growth so that the full potential of our productive powers can be reached.

Estimates of needs and potentialities in these developmental fields point to a total figure of some ninety to one hundred billion dollars (at 1943 price levels) for the next decade. Needs in residential construction alone are estimated to call for an expenditure of about fifty-five to sixty billion dollars. The proper management and direction of such a volume of investment can serve as a potent weapon for the achievement of continuous full employment. It is assumed that the vast bulk of the construction and other work involved will be handled through private initiative and a large share of the government-sponsored projects would be built, and possibly operated, by private contractors. But although the government share would be small in comparison, it can, through its planning, building, contracting, underwriting, and financing, stimulate and supplement private initiative so as to achieve the desired goal.

The potentialities of regional coordinated planning and development have been dramatically demonstrated by the T.V.A. The control and utilization of water, land, mineral, and forest resources, the provision of cheap electric power, and the agricultural and industrial research aimed at the economic development of the region's resources have opened important new outlets for investment, created permanent new sources of wealth and income, and raised the living standards of the region. Certainly, the gains to the national economy would be immense if such developments were increased twenty-fold or more—as called for by studies of regional potentialities.

Similarly, the integrated redevelopment of urban areas on a metropolitan basis would provide vast and steady outlets for investment. The rebuilding of cities would provide an investment lever of immense proportions, and clear the way for billions of dollars of private investment.

Developmental Programs vs. Uncoordinated Projects

Developmental programs of the type mentioned above are dynamic and flexible. The T.V.A. has demonstrated that an integrated long-range program presents infinite variation in volume, in direction, and in time element; for example, that a dam which ordinarily takes three years to build can be built in one year under pressure. Similar flexibility has been shown by the more advanced long-range urban programs, both as to the timing in the initiation of projects and in the rate at which they proceed.

It is because economic conditions vary greatly over time and between areas of the country that there is such a great need for a publicly controlled stabilizing element in the economy. It is not only a question of making public investment itself flexible, but also one of overcoming the bottle necks to private investment through such methods as research, land purchase (clearing the way for construction), provision of transportation and power facilities, provision of cheap credit, underwriting of projects, and improving the land resources, efficiency, and, as a consequence, the purchasing power of the farming community. If, at any time, an investment boom should develop, regional and metropolitan agencies of the type envisaged would be in a position to bring about a more balanced distribution of labor and material resources. An urban agency, for example, could limit certain types of construction activities through its control of land use; a regional authority could ease the shift of farm labor into industry, and direct its research toward breaking bottlenecks that are certain to develop.

It is important to realize that uncoordinated, make-shift public works programs of the traditional type have severe limitations for use in stabilizing the economy. Experience has shown that it is difficult to get the necessary advance planning and preparatory financial arrangements when masses of uncoordinated individual projects are involved, and that such projects offer little flexibility after they are under way. Moreover, there is a tendency to undertake those projects which are "ready to go" in terms of engineering and other plans rather than those which are most urgently needed. But possibly the greatest disadvantage of catch-as-catch-can public works programming on an "on again, off again" basis is the distorting effect it can have on various industries and various sections of the country. When all these factors are considered, the advantages of coordinated, flexible, long-range, developmental programs executed by permanent on-the-spot agencies, as compared with the haphazard bunching of individual projects, seem indisputable.

Technological Advance

A comprehensive full employment program must, of course, encompass additional measures. We have already noted the role which giant new industries have played in our economic development. Since no revolutionary new industry, such as the railroad or automobile, is now on the horizon, we must fall back upon a more rapid advance of technology within the existing industries, if we are to find private investment opportunities adequate to maintain full employment. But here again we run into the block of monopoly and monopolistic competition, and the tendency to shelve patents and to delay the introduction of new machines. Progress is slowed down in this manner, and the outlets for new capital formation, available under more vigorous price competition, are cut off.

The urgent need for technological advance suggests the desirability of deliberate action, of a far bolder character than heretofore envisaged, along a number of fronts: (1) the extension of government sponsored research; (2) vigorous anti-monopoly action, including not only "trust-busting," but also a clear-cut policy which would define the point at which public regulation begins and the further point at which public ownership is assumed; (3) encouragement of small units directed by the Schumpeterian-type entrepreneur and innovator; (4) government competition in certain fields and the use of the government "yardstick" in others; and (5) improved patent laws to permit wider use of inventions and to prevent shelving.

Summary

This article has discussed the problem of evolving an effective full employment program only in the barest outline. Because of the limitation of space, certain important elements of a full employment program, such as the role of monetary policy and international trade, have been left out completely or only lightly touched upon. The main purpose has been to emphasize the importance of certain of the dynamic elements in our domestic economy and their significance for a full employment program. The conclusion is that an equating of outlay with full-employment output will not by itself *create the conditions* for continuous full employment—even though such a measure must certainly be an integral part of a broader program. Deliberate government action is necessary to raise private and collective consumption, and to provide the conditions under which net investment can increase at a progressive rate as long as there are social advantages to be gained from such investment.

PART THREE

Economic Policy

I

Credit Controls, Interest Rates, and Management of Public Debt

BY

RICHARD A. MUSGRAVE

THE CREDIT structure of our economy has been profoundly affected by war finance. From 1940 to 1946 the volume of fixed interest bearing debt, public and private, rose from 215 to 450 billion dollars. United States Government obligations increased from 40 to 260 billion and now comprise over one-half of the total debt. As a result, the yield on Treasury securities has come to dominate the general level and structure of interest rates. Before the war, less than 40 per cent of the earning assets of commercial banks were in Treasury obligations; the present ratio is 70 per cent. Thus the link between credit policy and debt management has been drawn more tightly, and central banking is confronted with a new set of problems.

The current dilemma of credit and debt policy may be viewed as a triangular conflict between:

(1) pursuit of the traditional objectives of credit control, involving adjustments in credit supply and interest rates;

(2) maintenance of a low level of interest cost in the Federal budget and of stability in the market for Government securities;

(3) meeting the liquidity and earning requirements of various investor groups.[1]

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[1] Objectives grouped under (1) are usually thought of as problems of Federal Reserve policy; those grouped under (2) as a matter of Treasury policy. Questions of jurisdiction are disregarded here, as all three aspects are matters of public policy.

These different objectives clash in several respects. Traditional precepts of credit policy, during a period of inflation, call for the application of restrictive measures, while debt stabilization may require open market purchases. Yet, the Central Bank cannot restrict reserves to check credit expansion, and simultaneously purchase securities in the open market to keep their prices from falling. At other times, economy of interest payments required under the second objective may clash with equity considerations required under the third, and both may clash with needs for flexibility arising under the first objective.

Our problem is to appraise these conflicting objectives, to consider what compromises are possible in the present institutional setting, and to inquire what institutional changes may permit a more constructive solution.

I. INTEREST RATES AND MONETARY POLICY

Theorizing on monetary policy has been based largely upon the principle that real investment (i.e., capital formation) tends to increase when the rate of interest is lowered, and vice versa.[2] The general rule, extending from Wicksell to Keynes, has been to adjust the rate of interest so as to secure that level of investment which provides high employment and over-all price stability.

Wicksell and his followers were well aware that interest as a market phenomenon is a price paid for the use of money. This market rate of interest was contrasted with a "natural" or equilibrium rate which, in the last analysis, is not a monetary phenomenon, but depends on the rate of return to be expected from additions to the stock of capital. By adjusting the ability of the banking system to lend, credit policy was to be used as a device for changing the differential between the natural and market rates, thereby controlling the level of investment. The formula was refined subsequently, but the basic criteria for monetary policy remained much the same. The market rate of interest, as redefined in Keynesian theory, depended upon the money supply and liquidity preference. The rule now was to establish that rate of interest which equated the price for money and the marginal efficiency of investment (itself a first cousin of the old productivity concept) at such level as would call forth a full employment rate of investment. While the theory became more comprehensive and the number of variables was increased, the investment effects of changes in the rate of interest have remained a significant equilibrating factor in monetary and income theory.

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[2] No specific definition of the term "interest" can be developed here. Suffice it to say that the term is used in the economist's sense of payment for the use of funds where there is no default risk, but liquidity risks are included. Similarly, we disregard the fact that "the" interest rate is actually a structure of rates, differing with maturities. If any one rate need be referred to, the reader may think of "interest" as the return on a, say, eight-year U.S. Treasury obligation.

If the rate of interest *is* as potent a factor in determining the volume of investment as theorists postulate, it is important that public policy should regain the freedom of interest rate adjustment now largely abandoned in favor of guaranteed stability in the security market, and that means be developed whereby this can be done without unstabilizing security values unduly. If the premise does not hold, the conflict largely disappears. Considerations of debt management may then be taken as the decisive factor in interest policy. In re-examining this premise, we shall distinguish the longer run relationship between investment and the established level of interest from the shorter run effects of changes in the level of interest or of expectations of change. Finally, the investment effects of changes in the mere availability of bank credit, as distinct from changes in the cost of credit, will be considered.

Investment and Long Run Effects of Rate Level

(1) We first turn to the longer run effects of the level of interest on the volume of investment. Considering the burden which theorists have placed upon *interest as a cost factor* in real investment, there has been little proof of its importance. Such statistical evidence as has been obtained does not prima facie support the premise that the demand for investment funds is highly elastic

with respect to interest. Partly, this impression may be due to the fact that historically adjustments in interest policy have coincided with drastic changes in profit expectations (i.e., action is taken near the turning points of the cycle) which themselves give rise to sharp shifts in the demand schedules for credit. It stands to reason that in periods of rapid change in expectations such shifts will more than offset movements which may occur along any one schedule in response to changes in interest costs.

But this is not all. Quite apart from shifts in the demand for real investment funds, the demand schedule prevailing at any one time is characterized by a low interest elasticity. This is explained by the nature of the factors which enter into the planning of investment decisions. Investment in a piece of equipment is profitable if the present value of its income stream exceeds its cost. The profitability of new equipment thus depends on its cost, the income stream which it is expected to yield, and the rate of interest at which this income stream is discounted. The rate of interest is set by the cost of borrowing safe funds or the return available on safe investments, say, in Government securities.[3] The interest factor is the more important the longer the period of discount, but how long a planning period is considered depends upon the certainty of the earning outlook. In an unstable economy such as ours, the typical earning outlook is highly uncertain, since the probable value of the income stream depends not only upon the relative markets for specific products but also the general level of income, and this is highly unpredictable.

The uncertainty of the earning outlook increases progressively with the length of the planning period, so that it is customary for investment planning in many lines of business, covering a wide range of total investment, to disregard earning prospects beyond 5 or 10 years. An investment is not made unless "it will pay for itself" during that time. Since the effects of interest on the present value of an annuity depend upon its time spread, the shortness of the planning period greatly reduces the significance of the interest level. Indeed, the effect on profits of a very moderate percentage change in cost or earnings is likely to be equivalent to that of a relatively large interest differential.[4] This explains why the level of interest has but limited bearing on the volume of real business investment, with the possible exception of such fields as public utilities or municipal public works, which combine a high ratio of capital cost with a relatively low degree of uncertainty and hence have a longer planning period, or of residential construction, the demand for which depends largely on factors other than profit expectations.

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[3] Where the investor uses his own funds, the interest rate enters his calculations as an opportunity cost. Where he obtains funds against safe collateral, interest represents the cost of borrowing. Where he borrows without collateral the gross rate charged will include a risk premium.

As far as the cost of capital is concerned, the cost of risk and uncertainty (here referred to as the risk premium), rather than the cost of borrowing "safe" funds, dominates the investment decision; the return on safe funds (i.e., interest in the economist's sense of the term) is but one element in the cost of funds to the investor.[5] A 50 per cent reduction in interest paid on safe investment such as Government bonds, for instance, may result in, say, only a 10 to 20 per cent reduction in the gross (interest plus risk) rate paid on such risk investments as certain mortgages and equipment expenditure for the manufacture of a new product.

In a highly unstable economy where the planning period is necessarily short, little faith can thus be placed in the effectiveness of monetary policy if it is made to hinge on the rate of interest as a cost factor. The rate of return on safe investment is subject to manipulation by monetary policy, but, in an uncertain economy, it is no major factor in investment decision. The other component of the gross rate of interest—i.e., the cost of risk taking or risk premium—is of major importance in real investment decisions, but it is largely independent of monetary policy.[6]

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[4] To illustrate: The present value of an annuity of $1,000 paid annually over a five-year period and discounted at 2 per cent is $4,713. Should the interest rate rise to 5 per cent, which would be a 150 per cent increase, the present value would fall to $4,329. If, prior to the rate increase, the investment was just worthwhile, i.e., the cost of the equipment just equalled its present value, the investment after the 150 per cent rise in the rate of interest would result in a loss of $384. This same loss could have been brought about by an increase in the purchase price of only 8 per cent or an almost similar decline in anticipated earnings.

For development of this argument, see F. A. Lutz, "The Interest Rate and Investment in a Dynamic Economy," *The American Economic Review*, Vol. XXXV, December 1945.

[5] Again this statement is equally applicable to the investor who uses his own funds and finds that the cost of risk taking is large relative to the opportunity cost of safe investment, or to the borrower who pays a gross rate and finds that interest is a relatively minor component in the total charge.

A discussion of risk and uncertainty cannot be undertaken in this context. The term risk, as used here, is meant to cover both types of contingency.

(2) Nor is there reason to attribute great significance as a long run factor to the level of *interest as a determinant of the supply of loanable funds.*

While it is agreed that the higher the rate of interest, the greater the willingness to part with cash balances at any given level of income and money supply, this has hardly been a significant relationship for the practical range of interest rate changes, although it may turn out to be of somewhat greater importance in view of the increased ratio of money supply to income in the postwar economy. If income rather than price effects are considered, the result may, in fact, be the opposite. Just as the rate of savings may rise when interest falls (where the saver's objective is to reach a set total of interest income), willingness to lend may be higher at the lower rate level.

The level of interest, however, may be more significant for the distribution of funds between safe and risk investment. On general grounds, it may be expected that a low level of interest will result in a reduced cost of risk taking; or, putting it differently, that the gross rate charged on risk funds will decline by more than the fall in the rate of interest. There are two reasons why this should be the case. If the rate of interest is low, investors—institutional investors such as life insurance companies in particular—will find it necessary to supplement low incomes with earnings from risk taking. This income effect will increase the supply of risk funds. Moreover, if the rate on safe investment is reduced while the risk premium remains unchanged (and as long as the percentage decline in risk premium remains less than that in interest), the relative attractiveness of risk investment (i.e., the ratio of risk premium to net interest cost) is increased. This price effect will again mean an increased supply of risk funds, with the result that there will be further pressure on the risk premium. The reduction in the risk premium, brought about by these two factors, is likely to be more significant in reducing the gross rate on risk funds and inducing risk investment than is the decline in interest as such.

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[6] Yet, it is this "gross" rate which must be reduced if investment is to be encouraged under conditions of deflation. Policies must be devised which reduce risk and uncertainty. Arrangements for risk pooling and Government guarantees of risks offer a promising and all too neglected approach, but the more fundamental solution is to assure over-all stability of markets. By securing such stability, a substantial part of investment risk and uncertainty may be eliminated and risk taking be reduced to its proper economic function. The planning period can be lengthened and the importance of the interest factor be increased. A change in the rate of interest might then become of considerable importance in controlling the level of private investment.

Investment and Short Run Effects of Rate Changes

Short run effects of changes in the level of interest, and especially anticipations of rate change, may be more significant than the longer run effects of actual changes. This will tend to be the case even though the previously discussed effects of a higher or lower rate are not called forth instantaneously with a change in interest but will take time to work out. A reduction in the rate of interest will not be reflected immediately throughout the entire structure of rates in the economy. The operation of income and price effects to reduce risk premium similarly is a matter of time. To the extent that there is such a lag in the downward adjustment of gross rates on risk funds, effects upon real investment will similarly be delayed.

More important, however, is that the very change of rates itself may have certain short run consequences which will add to their immediate effectiveness. First, there is the familiar point that central bank action directed at a rate increase tends to be interpreted as a general signal of changing economic outlook, an indication that "the boom has run its course." Quite apart from the cost effects of a rate increase, this psychological factor alone may result in restrictive business action.

Anticipation of rate change, moreover, may be an important factor, especially with regard to the supply of funds for financial investment. As far as the demand for funds in real investment is concerned, an anticipated rate decrease will tend to delay investment and an anticipated rate increase will tend to accelerate it.[7] As far as the supply of funds is concerned, expectations of rate change work in the opposite direction, and may well be a major factor. For the supplier of funds, the prospect of higher rates will call forth a fear of capital loss and raise the desire for liquidity.[8] By shifting the supply schedule of funds, the resulting increase in liquidity preference may affect real investment directly; but its primary importance is likely to be with respect to financial investment where increased liquidity preference will check the upward pressure on capital values—stock market and real estate values in particular. The slowing down of the financial boom in turn will tend to spill over into the field of real investment and be somewhat of a retarding factor there by dampening profit expectations and checking further declines in financing cost.

Expectations of rate change accentuated by an exaggerated faith in the potency of monetary policy on the part of the financial community thus contribute what is probably the major element of effectiveness to flexible interest rate policy. Expectations

[7] The investor who is considering the use of his own funds in real investment may instead place his funds into 2½ per cent bonds while postponing the real investment in the expectation of borrowing later at 1½ per cent.

[8] This may be the case, even though liquidity preference may fall below the initial level after the higher rate is established and no further change is expected.

Expectations of rate increase are the more significant the lower the initially prevailing level of rates. The effects of the expected rate change on liquidity preference, as Keynes points out, depend upon the relative magnitudes of yield at constant rates on the one side and the capital losses and gains with changing rates on the other. The lower the initial rate level, the less is the opportunity cost of retaining cash, while the potential capital loss due to any expected absolute rise in the rate is the greater the lower the initial rate level. A similar argument holds for expected rate reductions, although it carries less weight.

of rate change may be effective whether or not the expected change comes to pass. Indeed, expectation of rate change, in the short run, will tend to be more effective than actual rate changes that have occurred, and quite likely they will be more significant than the longer run effects of actual rate changes. For these reasons, interest policy will be more useful as a device of cyclical policy than as a device of secular policy.

Investment and Availability of Bank Credit[9]

So far we have dealt with effects of changes in interest upon demand and supply factors in the credit market. The major conclusion has been that the effectiveness of interest adjustments is slight, mainly because interest elasticity of demand for funds is low. This must now be reconciled with the contention that the general effectiveness of credit policy does not hinge primarily upon borrowers' responses to changes in the rate of interest, in which case credit policy may be effective even though it be granted that the elasticity of demand for funds is low. Rather, the effectiveness of credit policy is held to rest on the "direct effects of changes in the availability of credit." As it is difficult to find a concise statement of the availability argument, we may venture our own interpretation.

(1) A change in the "*availability of credit*" evidently means a shift in the credit supply schedule. Suppose that the availability of credit is contracted, that is, the credit supply schedule is shifted to the left. As a result, the amount of credit taken is reduced and interest rises, depending upon the elasticities of demand and supply in the credit market. What then is the meaning of the proposition that "the change in interest is not important in determining the change in amount of credit taken"?

We interpret it to mean that the shape of the demand schedule is considered to be relatively unimportant, i.e., that the change in credit taken will be much the same, whether or not demand is inelastic. This, of course, is the case where the supply of credit is highly inelastic. In the extreme case where the supply has zero elasticity, the reduction in the amount of credit taken (due to the contraction in supply) will indeed be entirely independent of the demand elasticity. The latter will then be significant only in setting the new rate of interest.[10] In general terms, the more inelastic is the supply schedule, the less significant will be the elasticity of demand for credit in determining the effects of a given shift in credit supply on changes in the amount of credit taken. And for purposes of policy, it is the change in amount of credit taken that counts.

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[9] I am indebted to Ralph A. Young for most helpful suggestions on this section.

The availability argument thus emphasizes shiftability and inelasticity of credit supply. Looking at the over-all lending and investing ability of banks, the total credit supply schedule is entirely inelastic when banks are loaned up, and (contrary to the present situation) no additional funds can be obtained through sale of securities to the Federal Reserve Banks. If excess reserves (actual or potential) are available, however, not even the total credit supply can be expected to be entirely inelastic, since there is a choice between holding cash and investing. Analogous to the joint product case, moreover, one should expect the elasticity of supply to be greater for individual lines of credit than for the combined schedule. But some additional considerations, peculiar to the credit business, alter the picture. Differences in the net returns obtainable from different borrowers will undoubtedly affect the allocation of funds between different classes of loans and investments, but they are not the only factor. To a considerable extent, the allocation of funds is guided by the banker's desire to allocate quotas to different uses of funds, so as to obtain the right combination of risk and liquidity in his asset portfolio.

The quota system, thereby, introduces a considerable degree of inelasticity (with respect to interest) in the supply of funds available for different uses, especially when there is a change in total credit supply. When a bank's lending capacity is curtailed, the quota available for each group of borrowers will be cut somewhat, but the quota for risk loans will tend to fall off more sharply than that for credit to prime borrowers. Potential borrowers, especially in the risk group, will find that no additional funds are available even though they may be willing to pay a higher return.[11] Again, the reason is that the curtailment of funds is rationed out to a considerable extent on the basis of liquidity and risk considerations rather than with regard to earnings.

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[10] We assume that the demand for credit has some elasticity and there is a positive rate of interest at which the various credit supplies are absorbed.

Restriction of credit availability may thus be an effective means of controlling the use of credit even though the demand for funds is inelastic. The fact that these considerations have been given little attention in monetary theory—though availability considerations have for long been a factor in central banking policy—has led to an under-evaluation of their possible effectiveness as a restrictive device.[12]

(2) An important consideration in this context is that the effectiveness of availability restriction (i.e., reduction in amount of credit taken) does not derive from the unwillingness of borrowers to pay a higher rate. Therefore, its effectiveness will not be impaired if means can be found to neutralize its impact upon interest rates; and if this can be done, the conflict between credit policy and debt management is reduced. As long as demand is held constant while supply is reduced, the rise in the rate is unavoidable, however. In order to permit a curtailment in supply

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[11] When credit restriction is rationed out by way of curtailing risk credit, the concomitant tightening of interest may not only be relatively unimportant, but may indeed be hidden under the surface. While the gross interest charge remains the same, the riskiness of the average loan is decreased. The risk component of the gross interest charge accordingly is reduced, leaving an increased residual for interest in the economist's sense.

A quite similar situation arises in connection with direct curtailment of consumer and stock market credit. Here the marginal (riskier) borrowers are excluded by certain requirements for down payment. Under competitive conditions, one should expect, indeed, that the gross charge on such loans would be reduced with a tightening of requirements, unless the specific restriction was accompanied by a general curtailment of credit.

[12] Availability controls (as traditionally argued with respect to rate adjustments) are of little use for depression policy where the problem is one of lacking demand.

to be rationed out without a rise in price, demand must be curtailed. While such control is not feasible where the demand for credit as a whole is concerned, it is feasible in certain credit areas.

This, indeed, is exactly what is done through the use of familiar forms of *selective controls,* such as stock market or consumer credit controls. While the controls operate in terms of demand rather than supply restriction, they are nevertheless of the general character of availability controls; their purpose is to cut off the use of funds along certain lines and to do so directly and not through price adjustments. By enforcing a reduction in demand for certain lines of credit, selective controls, in effect, render it possible for the lender to ration out a reduced supply without cost increase. They are especially useful in areas—such as stock market credit where all borrowers may offer the same collateral—in which the lender alone is not in a position to ration. Specific credit controls thus permit credit restriction without forcing a rise in rates. Where rate stability is desirable as a matter of debt management, vigorous use of selective rather than general credit controls seems in order.

While selective controls provide no guidance over the secondary use of credit, this does not question their usefulness. The availability argument is not a proposition in quantity theory; what is most important is not the total money supply but the availability of credit to borrowers who, by definition, are would-be spenders. Where specific controls can be applied they permit better qualitative direction than does general restriction of availability which may not be rationed out in the most desirable way. However, it must also be recognized that in using selective controls monetary policy loses the impersonal nature of general credit restriction, a characteristic which has been considered one of the main advantages of monetary policy.

Conclusions

What may we conclude about the "correct" level of interest rates over the longer run and the need for flexibility of rate policy in short run adjustments?

The theoretical concept of an optimum rate has little practical application to the average level of rates maintained over a *longer run* period. On the demand side for funds there is no strong relationship between real investment and the level of interest cost, due largely to the high degree of uncertainty in profit expectations. On the supply side of funds, the level of interest rates may be expected to have little or no effect on the rate of savings, and only a sluggish effect on liquidity preference. The level of rates may be more significant as a factor in the distribution of available funds between risk and safe investment, but this is a far cry from the traditional postulate of a close and direct relationship between investment and the rate of interest. We are left with the conclusion that it is exceedingly difficult, within a reasonable range of rate variation, to prove that a somewhat higher or a somewhat lower rate level is the "proper" one. Due to the nature of the demand and supply relationship involved, our analysis leaves us with a wide range of indeterminancy as to the "proper" level of interest. During a period in which there is a secular tendency for investment to fall short of intended saving at high employment, the deflationary gap or deficiency in investment would be much the same with long-term interest rates at 1 or at 3 per cent. During a period of inflation pressure when there is a secular tendency for intended savings to fall short of investment, the higher level of rates as such would do little to lower investment and close the inflationary gap. If this is true, the desirable level of rates may be determined largely on grounds other than those just considered, i.e., distributional and debt management considerations become largely controlling.

The impact of rate changes upon the gross rate charged on risk capital takes time to work out, so that the previously considered effects of rate changes will be further reduced where the *short run* is concerned. Yet, changes in interest rates may have a significant psychological effect in the short run, and the anticipation of change as such may be an important factor in determining the supply of funds for financial investment. It may be useful, therefore, as a matter of cyclical stabilization to ease or restrict credit even though little may speak in favor of the longer run effects of the resulting new rate level. Because of these short run effects, and other considerations permitting, it will be desirable to retain some freedom in using interest rate adjustments as an element of cycle policy. In particular, it will be desirable, where possible, to avoid rigidities which exclude any possibility of change and thus rule out effects which may be derived by creating expectation of change.

Short and long run considerations may, of course, be interdependent. Thus it has been argued that a rise in rates in a boom period—although it may do some good from a short run point of view—is undesirable, because it may not be possible for political reasons to retrace this step later on, even though over the longer run economic conditions may prove to be such as to require a low rate policy.

Finally it has been pointed out that changes in the *availability* of credit may be a useful instrument of policy and that the effectiveness of such change does not primarily depend upon the reaction of demand to the concomitant increase in rates. If combined with direct controls over the demand for funds, rate increases may indeed be avoided even though credit is restricted. Where rate changes are found incompatible with other policy objectives, this suggests emphasis upon the use of selective rather than general credit controls.

II. INTEREST RATES AND DEBT MANAGEMENT

Debt policy in coming years will be primarily a problem of managing the large body of debt *now* outstanding. What does this imply with regard to budgetary interest cost, the level and stability of rates, and the maturity composition of the debt?

Budgetary Interest Cost

From a budgetary point of view there is a presumption in favor of low interest payments, i.e., a low level of rates and/or short maturities.

Suppose that interest payments are to be increased. This may be done at the cost of other expenditures, in which case no question of financing will arise. The budgeting considerations will then depend upon the relative merits of higher interest payments as against those of alternative expenditures. Where higher interest payments are a net addition to the budget, additional financing is required. If they are to be tax financed, possible deterring effects of increased taxation upon consumption and private investment may develop, notwithstanding the popular argument that "no harm can be done where an internal transfer of funds only is involved."[13] While increased interest payments raise taxable income as well as revenue requirements, this will not prevent the need for increasing the tax to income ratio; and to the extent that depressing effects result therefrom, they are not relieved by the fact that the receipts are channeled into transfer rather than real expenditures. Except under inflationary conditions, such depressing effects are undesirable. Where the additional interest payments can be loan financed, the case may differ. Within a reasonable range, depressing effects of additional taxation may then be avoided or offset by financing an appropriate fraction through borrowing. But even then there are limits to the total level of expenditures which may be financed without disturbing repercussions,[14] and higher interest payments are likely to remain less desirable than alternative increases in other expenditures.

The importance of these arguments will depend, of course, upon the magnitude of the rate increase and the nature of the

[13] Conceivably increased tax and interest payments may raise consumption but, with the given distribution of debt holding and revenue structure, this is unlikely. See note 27.

[14] It does not follow that, whatever the level of transfer expenditures, "Functional Finance" rules will always provide some combination of tax and loan finance for which high employment and price stability are maintained. Carried to the extreme, the system will break down, even if optimum taxes are used. (The case of a specific tax on interest income, i.e., interest free finance, is ruled out.) Given an exorbitant ratio of transfer expenditures to earned income, the rate of tax required to check inflation might be extremely high and so reduce the fraction of earned income retained after tax (to an infinitely small percentage in the limiting case) that the entire process of automatic allocation and factor pricing, essential to a decentralized market economy, will cease to function.

particular situation, but in principle the budgetary presumption for a low level of interest payments is on fairly safe grounds. This, we note, means a presumption not only in favor of low rates but also of short maturities. The problem is two-pronged. But all this is not to suggest that cost considerations should be controlling, especially where changes in rates are not to be of long duration.[15] They are one factor in the picture, but by no means the only factor. The objective of debt management to keep interest cost low is a partial objective and must be balanced against other objectives which will now be considered.

Debt Management and Rate Stability

(1) In recent discussions, much emphasis has been placed upon the need for price stability of Government securities. Basically, this means that debt management must maintain public credit "in good standing." There must be assurance that the investment community in the aggregate will wish to continue to hold the debt to maturity; that it will absorb new issues offered in refunding of maturing debt; and that it will absorb such additions to the debt as may prove necessary. The implication of these requirements is not that "default" must be avoided; sufficient total demand for Government securities cannot fail to exist since the Government itself controls the market for its obligations through the medium of credit policy. Rather the implication is that the debt must be placed with desirable investors and at desirable terms, and that the Government is protected against having to

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[15] Successive shortening of maturities will not necessarily reduce the average rate paid, however. The Treasury, acting as a monopsonist, will "purchase" funds of varying maturities at such amounts as will equate marginal costs. The fact that shortening of maturities will tend to result in a continuous reduction of financing cost is due to the highly elastic supply schedule for short-term (largely bank) funds.

With regard to short-run adjustments in rates, note that a change in rates does not apply immediately to total debt outstanding, but only to that part of the debt which comes up for refunding. If the present level of rates was doubled while the present maturity composition of the debt was maintained, interest cost to the Government would eventually rise from five to ten billion dollars. Yet, the increase within one year would be only three hundred and fifty million and after five years, only one billion.

monetize debt or to condone its monetization, at an inopportune time.

This points to the central conflict between credit adjustments and debt stability. If fluctuations of security prices are prevented in the first instance by offsetting credit measures, stability of security prices is assured, but the use of general credit restriction as a cyclical control device is surrendered. If, on the other hand, instability of security prices is permitted, a danger of cumulative fluctuation in security prices arises; the ordinary course of refunding operations may be interfered with, and the Government's credit standing may be subjected to the strain of wide price fluctuations. With a two hundred and fifty billion dollar debt, this contingency cannot be permitted to develop. Credit policy will have to step in at some point, and failure to intervene initially might require even greater debt monetization later on. But are these the only possibilities?

Stability in security prices, of course, is a matter of degree. It is not evident that the protection of public credit standing requires the maintenance of complete price stability. The question arises whether the basic stability requirement may not be compatible with such fluctuations in security values as would be occasioned by a moderately flexible credit and interest policy. The initial swings in security values induced by such a policy involving, say, changes in the level of rates (or yields) of up to 20 per cent, are not likely to be drastic in the sense of endangering the asset position of investors. The real problem, however, is whether more violent swings might not result from such initial changes.[16] The effectiveness of even slight fluctuations in interest, as is frequently argued, may have become significant due to the large bank holdings of public debt; but similarly, even slight fluctuations may, for the same reason, produce major disturbances. In other words, if moderate initial fluctuations in security prices are permitted, can the total swings be held within reasonable limits?

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[16] The amplitude of fluctuations in bond prices corresponding to given fluctuations in yield is a function of the maturity of the debt. Whereas a 20 per cent increase in the yield of consols would be reflected in a 16⅔ per cent decline in their price, a similar rise in the present yield of 2.3 per cent on 2½ per cent, twenty-year bonds would result in a price decline from 103 to 96; for the yield of 1.4 per cent on a 2 per cent five-year maturity, the result would be a decline from 103 to 101.4 only.

This returns us to the question of how the debt is placed among various investor groups. Where the debt is held by bona fide investors, the dangers of snowball effects will be very much less than were it held by speculators. To the extent that the debt is held by investors over whose portfolios public authorities possess some control, the dangers of sudden liquidation are similarly curtailed. To place the debt safely, specific needs and preferences of different investor groups must be taken into consideration. Thereby, it should be possible to establish stability in those parts of the market where it is most needed, and gain freedom to permit flexibility in other sectors.

(2) The most obvious distinction is between security holdings by commercial banks and holdings by other groups. With respect to bank holdings, two issues arise.

First, there is the problem of checking uncalled-for credit expansion (and resulting pressure on rates) generated by the efforts of banks to increase (or prevent a decline in) their earnings from Government securities. As banks sell short-term issues to the Federal Reserve Banks (which absorb these issues in the process of maintaining the rate structure) and purchase longer issues in the market, additional reserves are obtained, total security holdings by banks are expanded, and the money supply is increased. This problem has received a great deal of attention and must be solved before effective monetary control is restored. However, it is not the major issue in central banking reform, and from the economist's point of view it presents no great difficulty. Barring political obstacles, quite feasible solutions are available.[17]

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[17] These imply some measure of direct control over bank holdings of Government securities or earnings derived from such holdings. A step in this direction has been taken in the course of war finance by rendering the bulk of issues with maturities over ten years ineligible for bank holding, but more need be done. One approach might be to require banks to hold low interest bearing

Second, and more important, is the problem which arises if commercial banks want to reduce their security holdings on balance in order to obtain reserve funds (or to offset restrictive action by the Federal Reserve) for purposes of expanding credit in private assets. The provision of a mechanism by which this can be prevented is the basic problem of reconstituting central banking policy. Again, various approaches are available, some of which also help to solve the first difficulty and most of which constitute a shift in the direction of 100 per cent (or high) reserve proposals.[18] Bank holdings of Government securities may be replaced in part with issues not attractive or not available to other investors; a part of present security holdings by banks may be included in reserve requirements; or, more simply, a part of present security holdings may be transformed into required cash reserves which, if necessary, may be interest-bearing.

(3) Among nonbank investors, the major distinction is that between bona fide investors, who purchase Government securities primarily for income and safety, and speculative investors, who have a major interest in capital gains. Speculation in long-term Government securities, extending beyond that needed for

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issues, another to limit their holdings of longer issues. The most direct way of meeting the problem would be the application of a tax on bank earnings from Government security holdings in excess of a certain *average* return on their portfolios.

Solutions along these lines have been adopted by other countries. Canada, has, in effect, accomplished the same kind of result by obtaining an agreement between the Government and the chartered banks that earnings before income taxes on savings deposits would not exceed the cost of interest and other expenses of the "average" bank by more than ³⁄₁₀ of 1 per cent of the amount of such deposits. In the United Kingdom, a similar solution has been reached by informal agreement between the Government and the chartered banks.

[18] Cf. *Annual Report* for 1945, Board of Governors of the Federal Reserve System, pp. 1–8, where two suggestions are made, one for limiting holdings of long terms by banks (over and above the restrictions imposed by present eligibility rules) and another for requiring additional reserves to be held in the form of short-term securities. The first of the two plans seems more useful as a check to the expansion of bank security holdings by shifting into longer maturities, and the second, as a more general device to restore Federal Reserve control over credit expansion of all kinds.

Enactment of a certificate reserve plan was proposed by the Board of Governors in November 1947. See *Federal Reserve Bulletin* for December 1947, p. 1461.

maintaining a smooth rate structure, serves little if any economic function; and, by unstabilizing long-term yields, such speculation might render it difficult even for bona fide investors to stabilize their holdings. The problem may be solved in part by devices (such as proper tax provisions, margin controls, and controls over security loans) which will reduce speculation directly, and partly by meeting the investment requirements of potential long-term holders increasingly through nonmarketable issues of the savings bond type. By rendering the capital value independent of market fluctuations, the terms of these issues increase the investor's liquidity position. In the absence of speculative intentions, there is no pressure to liquidate such holdings due to fear of capital losses if a decline in the price of market issues occurs. If, on the other hand, sales are made, they are made to the Government, and will not result in cumulative pressure upon security prices.

Fears might arise that the use of nonmarketable issues might increase the investor's dependence upon public debt policy. This is hardly the case. The use of nonmarketable issues does not permit debt management to disregard investor's preferences; yields on nonmarketable issues cannot be set without reference to what the investor can earn somewhere else; investment in nonmarketable issues is no less voluntary than investment in marketable issues, and the freedom of redemption is indeed greater. Central banking policy is an important determinant of prices and yields, with or without the use of nonmarketable debt. In neither case is the level of rates established by automatically determined forces of supply and demand, but by market conditions which depend, to no small measure, on credit policy. The only freedom which would be curtailed by an increased use of nonmarketable issues is that of speculation, i.e., to earn a return above the one provided for in the coupon rate. For bona fide investors, this loss should be more than offset by the gain resulting from stability. If insurance companies wish more generally to place funds into less gilt-edged investment outlets (and it is desirable, within limits, that they do so), such funds should be channeled into increased investment in private enterprise. Under certain conditions, to be considered later, the supply of a long-term investment medium might be recognized as a proper function of debt management, but under no conditions should it be the Government's function to supply opportunities for speculation.

(4) To the extent that the speculative element is discouraged, a substantial part of the long-term holdings of insurance companies, savings institutions, and small investors are replaced by nonmarketable issues, and some closer control is obtained over bank holdings in Government securities, the task of maintaining stability in the security market is greatly simplified. Given these policies, the danger that moderate fluctuations in security prices could assume snowball proportions will be greatly reduced. Thereby, some leeway for the use of flexible credit policy will be restored.

Funded vs. Unfunded Debt

The problem of stabilizing Government security holdings as discussed in the preceding section carries interesting implications for the issue of funded vs. unfunded debt.

(1) According to traditional theory, a sound debt structure is a long-term debt structure. This classical view has been stated as follows:

> As a general principle of finance it is unquestionable that the floating debt should be kept within the narrowest limits possible.—The great evil of floating debt is its uncertainty. To be open to the risk of a sudden demand for payment is to be in the position of a banker without the securities with which he provides himself; and it is precisely in times of commercial difficulties that the call is most likely to be made.[19]

There is good sense to the main objective here stated: Debt management should avoid placing the debt with investors who will subject the Government to the risk of having to cash in on its debt at an inopportune time.[20] But the principle needs reformulation in two respects. First, the real danger is not the Government's inability to raise funds in a period of economic distress. The need is for avoiding debt monetization in a boom period when it is desirable to hold down expansion in the degree of liquidity that prevails in the economy. Second, it cannot be argued under present conditions that a short-term debt will necessarily involve a greater risk of forced monetization than a long-term debt. This is true only in a legalistic sense. If maturing debt is presented for redemption it *must* be paid, while non-matured debt presents the Treasury with no such legal obligation. But as we have seen, this does not mean that payment may not be necessary anyhow. If non-bank investors, or all private investors, want to sell on balance, public authorities cannot afford a hands-off policy, while permitting prices to fall to any level the market may allow. The vast volume of outstanding debt and possible cumulative effects of a sharp decline in prices forbid this. The mere fact that outstanding debt is long-term gives no assurance that the Government may not be called to pay such debt at the wrong time.

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[19] C. F. Bastable, *Public Finance*, 3rd ed., London, The Macmillan Company, 1903, pp. 694, 695. Reprinted by permission.

(2) If, therefore, long-term debt *per se* does not provide the safety which has been attributed to it traditionally, why not turn the entire debt into short terms, or, to carry the argument to its conclusion, why not turn the entire debt into money? [21] Short-term debt is not only normally cheaper, but also gives a greater degree of flexibility to debt management.

Under the extreme assumption that the yield on all maturities is fixed with complete rigidity, this is indeed a powerful argument. The degree of liquidity will then be the same for a perpetual bond as for a one-day bill or money, and on such terms there is no occasion to issue longer obligations. The only reason for paying higher returns on one security than on another might be social policy considerations, as discussed in Section III. If it is considered necessary to grant higher earnings to some investor groups, payment of higher rates on short obligations is preferable, under these conditions, to the issuance of longer term obligations which merely add to the rigidity of debt management without offering the Government any advantage in return.

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[20] The fact that a short-term debt involves more frequent refunding operations is a part of this more general problem. If investors are willing to maintain their holdings of debt which has not yet matured, they will also be willing (barring special circumstances) to refund their maturing debt.

[21] The term "monetization" which is commonly used to include shift of debt into the private banking system is avoided advisedly in this connection. While "monetization" turns debt held by the public (excluding banks) into money, it does not wipe out debt in exchange for money, as does the no more inflationary process (assuming proper action on bank reserves) of purchasing outstanding debt by creation of Treasury currency or Federal Reserve credit.

Actually, this extreme assumption does not apply. Even if there is a general policy of maintaining the level of rates, the possibility of minor changes in the rate level or adjustments in the structure of rates will remain, especially if one allows for the possibility of political change which may bring revisions of policy. For this reason there remains some liquidity difference between short and long issues, and (unless there are expectations of a declining trend of rates in the future) the Government must pay higher rates if it wishes to place longer issues. This will pay only if it can be shown that longer issues will provide a higher degree of "safety"—not because the Treasury is without legal obligations to cash prior to maturity, but because these issues are less likely to be presented for cashing. The extent to which the latter is the case depends largely upon the degree to which price fluctuations are permitted, i.e., a possibility of capital loss exists. At best, it is a tenuous condition to rely on.

The case for paying a higher rate of interest certainly is greater where in exchange there is some direct assurance by the investor that his security holdings "will stick." This involves long maturities as a necessary but not as a sufficient condition. To carry the argument to the extreme, the Government would have the investor commit himself to retain his holdings of Government securities for a stated period of time, or to agree that public authorities may temporarily suspend the cashing privilege for specified periods. This might not be practicable, however, as it might reduce the liquidity of security holdings to a point where the investor might insist on an excessively high return. The technique employed in saving bonds offers a fair compromise. The investor retains a high degree of liquidity, yet the terms of these bonds, which by their very nature must be nonmarketable, impose a penalty upon early disinvestment, as the reward of higher interest payments is received only if the bond is held for a longer period. Investors who are not willing to accept this condition have little claim to long-term yields. The logic of our argument thus points to a debt structure where the bulk of long-term issues is in nonmarketable form while the remaining marketable debt is largely short-term. The yield pattern on nonmarketable debt, in the framework of such a debt structure, would, of course, have to be kept below that of the marketable debt, so as to allow for the difference in liquidity.[22]

The revised "funding principle" thus involves two requirements. First, means must be provided for controlling debt monetization by banks so that the creation of excessive money supplies can be prevented. This is not a matter of lengthening short maturities but requires a direct approach. Second, and with regard to nonbank held debt, the term "funding" must be redefined to mean the replacement of marketable long-term debt with nonmarketable issues, with interest correlated to the period of holdings. A sound debt structure, according to this principle, is one where some direct control over bank holdings exists, where the bulk of the long-term debt has been converted into nonmarketable issues, and where the remaining sector of marketable debt is largely in short-term form.

Another and more radical principle has been suggested by Henry Simons who would abolish all intermediate maturities between cash and consols (i.e., various forms of "near-money") while permitting consols to fluctuate freely.[23] Our criticism of the traditional funding argument again applies. Consols require no formal refunding, but this does not prevent the risk of forced monetization where drastic fluctuations in the security market must be prevented. While the distinction between marketable issues of different maturities does indeed become meaningless if all yields are frozen, this extreme assumption does not apply. Moreover, the maturity distinction remains significant if the rate of return is linked to the period of holding as here proposed. On these terms, there is no reason why investors' legitimate preferences for maturities of various lengths should not be met and be utilized to stabilize debt holdings, (i.e., to "fund" the debt in our sense of the term), thereby permitting some flexibility of security yields and prices while protecting the Treasury against excessive fluctuations in security values and financing costs.

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[22] If it is short term, while the nonmarketable issues are long-term and bear increasing yields towards maturity, there would be little conflict between the two patterns.

[23] Cf. Henry Simons, "On Debt Policy," *Journal of Political Economy*, December 1944.

However, it would be unrealistic not to note that the significance of our refunding principle, as stated in its pure form, is more to point out the nature of the problem on hand than to offer an immediate solution. Certainly, its implementation would take time and involve considerable practical difficulties. Some twenty billion dollars of marketable issues are now outstanding which are callable within ten years. Refunding of these securities would have to be a slow process unless (1) investors were tempted to refund into nonmarketable issues by the offer of more attractive yields, or (2) a policy was adopted of purchasing for cash and at market price (in most cases, above par) issues which are not yet callable, while offering nonmarketable issues in return.[24] A policy of this kind would have to be undertaken gradually and when the opportunity arises so as to avoid excessive pressure on yields. At best, the refunding process could be accomplished over a number

[24] The policy of purchasing above par is unorthodox and would require special legislation. (The Third Liberty Bond Act of April 4, 1918, authorized the Treasury to make limited market purchases, but not above par plus accrued interest.) Note, however, that the purchase of market issues above par and their refunding in new issues of equal length to call date would not result in increased interest costs (except to the extent that such increase represented a rate differential between marketable and nonmarketable issues), but merely in some increase in the par value of the total outstanding debt.

of years. Until then and as a more immediate solution to the problem, primary reliance must be placed on the other approaches, especially increased control over bank holdings of securities.

Competition for Private Funds

While debt management should be prepared to incur a higher cost where this serves to purchase increased stability of debt holdings, the rate of return paid on Government bonds (which again is a function of both the coupon rate and the supply of various maturities) cannot be set without regard to its effects upon real investment in private ventures. From the longer run point of view, it may be postulated that yields on Government securities should not be maintained at a level which will divert funds from private capital formation. A high return on safe funds will also tend to raise risk premiums and the gross rate payable on risk funds. This places an upper limit on the permissible return on Government securities, especially on issues which are purchased by investors (such as large individual holders) who might otherwise place their funds into risk investment. Restating our previous conclusion, it is not likely, however, that the level of real investment will be sensitive to moderate (say, one point) changes in the long-term rate. To repeat, there is a considerable range of economic indeterminancy as to the "proper" rate level.

Over the shorter run changes in the rate of interest may be more significant, but this is also the point of immediate conflict between credit and debt policy. The use of credit control as a cyclical device has to rely mainly on changes in the availability of credit and such changes in rates as are not transmitted through the entire public debt structure.

Conclusions

Requirements of debt management for rate policy may be summarized as follows:

(1) From a budgetary point of view, there is a presumption in

favor of low interest payments, involving short maturities and a low level of rates.

(2) Drastic fluctuations in security values are not permissible in view of the large public debt, but changes may be made in the debt structure which will tend to stabilize security holdings and reduce the likelihood of drastic fluctuations. This involves control over bank holdings of Government securities and reliance on special issues of the savings bond type to meet the long-term needs of institutional investors. Given such adjustments, some flexibility in credit and interest policy should be compatible with a fair degree of stability in the security market.

(3) The traditional principle in favor of funded, as distinct from floating, debt does not apply, unless "funding" is redefined to mean the stabilization of bank-held debt, and the placing of debt outside the banking system with investors who will hold securities for a long period. Higher interest payments are worthwhile where they are effective in obtaining greater certainty of continuity of holdings. This involves longer maturities as a necessary but not a sufficient condition. To assure stable holdings, nonmarketable issues of the savings bond type are required.

(4) Excepting inflation periods, the return on Government obligations must not be permitted to rise to a level where funds are diverted from real investment in private business.

III. INTEREST RATES AND INCOME DISTRIBUTION

Since changes in interest rates involve changes in the income of investors, considerations relating to income distribution are bound to be a significant factor in rate policy. They are here discussed but briefly, not because they are considered of lesser importance than other aspects but because they have been dealt with more fully by other writers.[25] In some instances, equity aspects overrule other considerations; in most cases other considerations (as those relating to employment, price, or debt stability) will not give a very specific and determinate answer. Within a considerable range, then, monetary and debt authorities cannot escape the responsibility for judging the "adequacy" of investment incomes. And this is a matter of social philosophy.

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[25] See, for instance, the essay by H. C. Wallich, "Public Debt and Income Flow," in *Postwar Economic Studies,* No. 3, Board of Governors of the Federal Reserve System, 1945.

The General Level of Rates

Problems arising in this connection largely refer to earnings of particular investor groups as derived from the particular issues which they hold, but the impact of the general rate level upon the income distribution as a whole may be briefly considered.

Estimates suggest that an increase in the general level of rates paid on Government securities, assuming the prevailing rate structure and the prevailing distribution of debt holdings to continue, would increase the inequality of income distribution. Out of total interest payments on publicly held United States debt, which amount to about four billion dollars, somewhat less than 40 per cent are received by individuals directly, and about 20 per cent by families with incomes under $5,000. If we include such portions of interest payments to banks and institutional investors as may be imputed to the under $5,000 group, its estimated share becomes about 40 per cent.[26] Yet, its share of total Federal taxes raised to finance additional interest payments is likely to be 50 per cent or more. If the dividing line is drawn at a lower income level, the spread will be considerably wider. Also, one must allow for the fact that a change in the return on public debt will be reflected in a change in interest charged on private obligations, so that the resulting total change in interest payments will be a multiple of the change in public payments.

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[26] The estimates are based on the distribution of debt holdings for December 31, 1946. In allocating the debt held by individuals between families with incomes over and below $5,000, it is estimated that thirty billion dollars, out of a total of sixty-three billion, is held by the lower group. It is assumed that only Series E bonds are held by the lower group and the distribution of E bond holdings is estimated on the basis of results from the Federal Reserve–B.A.E. Liquid Asset Survey.

Total interest payments of four and two-tenths billion dollars (including accrued interest) to private holders are then allocated by estimating interest received for each category of investors by issues held and yields thereon. Interest on savings bonds is computed at a rate corresponding to the average maturity of issues outstanding, so that this rate will increase over time. In imputing to the under $5,000 group, interest paid to other than individual investors, it is assumed that they receive no share in interest paid to commercial banks. The allocation of interest received by savings banks and insurance companies is estimated on the basis of information regarding the size distribution of accounts and policies.

Where the rate change contributes to a higher over-all level of real income, the result may, of course, be an improvement in the absolute position of all groups. But it should also be noted that an increase in inequality will raise the propensity to save which, in periods of insufficient demand, will tend to make the maintenance of high employment more difficult.[27]

Nonbank Investors

A situation might arise where considerations of social rather than purely economic policy speak in favor of paying a higher rate of return to some groups of investors than to others. For instance, conditions might arise where it is desirable on social grounds to strengthen the position of small savers by paying a higher return on limited holdings of such investors, even though such a higher

[27] With respect to public interest payments alone, the magnitudes involved are not likely to be very significant. Using such sketchy evidence as is available, it may be estimated roughly that the net increase in savings (out of a given total income) which currently results from tax financed interest payments of five billion dollars, amounts to about one and a half billion.

On this basis, a flat 50 per cent increase in rates would reduce consumption out of a given total income) initially by about seven hundred and fifty million dollars, with a larger decline after secondary effects are allowed for. (These estimates are based on those by H. C. Wallich, in his above-mentioned study.) If we allow for the resulting increase in interest throughout the economy, an increase of private interest in the magnitude of perhaps as much as ten billion (including the interest components of profits) might eventually have to be added to the two and a half billion increase in public interest payments. As the increase in private interest payments will be largely financed out of a "sales tax" (i.e., higher prices) which will be reflected in substantial part in reduced consumption, while increased interest receipts will be reflected in higher savings, the net effect may be a substantial shift in the direction of saving. However, it must again be noted that these effects will work themselves out only over a substantial period of time as outstanding fixed interest obligations mature and are refunded at the new rate.

rate might not be justified if considered merely as an inducement to increased bond purchases.

A similar problem may arise with respect to institutional investors. Suppose that sooner or later economic developments should resume the deflationary trend of the pre-war decade. It might then become desirable, on grounds of general economic policy, to increase liquidity. This in turn might produce a situation where public debt could be placed with institutional investors at rates substantially below customary standards. Under such conditions, should a bonus be paid in the form of higher rates, assuming that this can be done without seriously diverting funds from private investment? Or, to add a related question, should the long-term rate be maintained when available funds from nonbank sources are in excess of investment needs?

This raises broad issues of social policy. How important is it, for instance, to maintain investment incomes of endowed educational institutions at a level not too far below the customary standard? Should the Government assure investors that they may budget their private savings over a life span without being disturbed by possible longer run changes in the rate of interest? That is, must policies be avoided which might require downward adjustment in life insurance annuities or increases in premiums? In those cases in which support is decided upon, are higher interest payments the most effective approach? These issues cannot be debated here, but two general observations might be added.

First, where fixed investment income is needed, it is preferable, as a matter of economic policy, that it be provided through interest on Government debt rather than through fixed interest (or rigid dividend) payments on private debt. Since the former payments may be deficit financed more readily during depression periods, they do not involve quite the rigidities produced by private debt. Second, if a special public responsibility is recognized toward the small saver, it is far more important to eliminate the risk of loss in the purchasing value of his capital than it is to provide preferential interest payments. Short of the broader and more difficult objective of general price level stability, this may be done by making available a stable purchasing power bond.[28]

Problems of income adequacy of interest rates may be approached along two lines.[29] One is to maintain the general level of rates on longer term issues sufficiently high so as to assure what is considered an "adequate" level of earnings, while taking steps (through rate subsidies or risk pooling) to lower the cost of capital to private users in those areas of investment where capital formation is most likely to be stimulated. Another course is to assure a lower over-all level of rates while making special provision for increased earnings where these are considered socially necessary. The first course provides for a more impersonal and perhaps less arbitrary solution of the earnings aspect of the problem while requiring more specific intervention with respect to investment inducements; the opposite holds for the second course.

Commercial Bank Holdings

About one-third of interest payments on publicly held United States obligations are received by commercial banks, and these payments furnish about one-half of commercial bank earnings. Banks, which like any other enterprise operate for profit, cannot be expected to disregard the earning aspects of security holdings. Public authorities, similarly, cannot afford to disregard the effects of their policies upon bank earnings, although the major tasks of credit and debt policy must not be subordinated to the minor one of preventing excessive and, possibly, assuring adequate bank earnings. Moving debt out of banks, for instance, may be a way of reducing bank earnings; yet, a policy of demonetization should be undertaken only when there is excessive liquidity. Monetization of debt, similarly, is a means of raising bank earnings, but it should not be undertaken unless more general considerations require it.

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[28] This is of importance particularly in a full employment economy where the long-run trend for prices points to a slow increase, rather than decline. See the proposal by G. L. Bach and R. A. Musgrave, *American Economic Review*, Vol. XXXI, Dec. 1941, p. 823.

[29] These alternatives were suggested to me by Professor John H. Williams.

To disentangle the control of earnings from the control of credit, more direct approaches of the previously discussed kind are needed.[30]

After effective techniques of control have become available, authorities are left with the task of defining what constitutes a "proper" level of bank earnings, that is, a level which—in relation to earnings in other lines of business—is sufficient to call forth the necessary volume of bank capital.[31] After a definition of "fair" earnings has been found, and even in the absence of any excess earnings, a more difficult problem still remains. The function of the banking system in the economy in general and its contribution to Government finance in particular are such that a substantial share of banking costs is properly defrayed by earnings from public obligations rather than from earnings on other investments and loans, or from service charges. But there remains the problem of what constitutes the proper share of bank earnings from this source.

IV. AN INTEGRATED INTEREST POLICY

Regarding the "proper" *level* of rates applicable under average conditions and over a longer period, economic analysis provides the most general guidance only. The level of real investment as well as the supply of funds over the longer run is too insensitive to interest to render rate adjustments an effective means of secular control. The "proper" level of rates over the longer run thus depends to a considerable degree on other considerations. The amount of longer term Treasury bonds outstanding and interest paid should not be so high as to divert funds from risk investment in private business. Also, there are further presumptions in favor of low interest charges on budgetary grounds, and in order to sustain high level consumption. At the same time, rates should be high enough to permit placing the debt "safely" and, under certain conditions, to allow for considerations of earning adequacy.

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[30] See above pp. 238 and 239.

[31] The very concept of bank capital itself involves difficulties. According to traditional thinking the function of bank capital, as distinct from capital in most other enterprises, is not to furnish funds for the purchase of capital goods or for operating needs, but to provide some reserve fund for the protection of the depositor's claims. The amount of capital needed, accordingly, must be related to the composition of bank assets. With a large volume of Government security holding, the concept of a capital to risk asset ratio is more meaningful than that of a capital to total asset ratio.

Flexible credit policy, however, may be used as an instrument of restraint in the expansion phase of the cycle. Similarly, it may be useful in conjunction with a successful full employment policy. Such a policy will create a more continuous need for controlling inflationary pressures than has existed in the past; the Blondinian state of affairs which it implies is par excellence that in which the balancing rod of credit adjustments may be of some use. Unless made imperative by the requirements of a stable debt structure, their use as an instrument of restraint should therefore not be discarded. If income stability is assured, moreover, the planning period for investment will be lengthened, and thereby the significance of interest as a cost factor will be increased.

At the same time, it must be recognized that sharp fluctuations in interest rates are incompatible with the requirements of a stable debt structure, and that even moderate fluctuations may raise serious problems. Within the present structure of security holdings, of types of debt used, and of available credit controls, a forceful general credit policy is thus not possible. Yet, as far as the economist's blueprint is concerned, an integrated credit and debt policy *can* be developed which will combine the requirements of a reasonable degree of flexibility in credit control with that of stability in security values.

On the credit control side, this requires inventive and vigorous use of familiar selective controls and the possible development of similar controls in other areas. On the debt side, it requires certain adjustments to assure that debt holdings will "stick," i.e., that debt monetization will not be forced upon public authorities at an inopportune time. These adjustments include provision for some direct control over the security portfolios of commercial banks and a policy of refunding longer term debt held by bona fide investors into nonmarketable issues. The first provision could be introduced promptly, while the second could be implemented only over a substantial period of time. Given such structural changes, maintenance of debt stability will become possible without having to permit bank credit expansion at inopportune times, and some degree of credit restriction will become feasible in boom periods without endangering debt stability.

It will be objected that the intended compromise between stability and flexibility is unobtainable; that returns on capital throughout the economy are tightly interwoven and that stabilizing any one part means stabilizing the whole. But rate flexibility, like all economic matters, is a question of degree. Even though long-term public debt issues are nonmarketable rather than marketable, their volume and coupon rates will still bear upon the demand of institutional investors for other investments. Even though banks are not free to vary their Government portfolio at will, changes in their reserve position will still affect the level of short-term yields. The remaining link between bank reserves, yields on Government debt, and capital values in the economy at large will still be sufficient for restrictive or expansionary tendencies to be transmitted. At the same time, the long-term public debt will be cushioned against market fluctuations.

Pending implementation of these or related structural changes, measures of credit restraint will be confined to the narrowest limits. Credit policy, far from being able to render a positive contribution to economic stabilization, will be hard-put to prevent unstabilizing credit developments. This will do the less harm the more effective the use which is made of other and more powerful means of stabilization, such as general fiscal policies or wage and price measures. However, the potential availability of more powerful approaches is no assurance that they will be used. In the meantime, one cannot discard lightly the use of credit controls.

II

The Burden of the National Debt

BY

ABBA P. LERNER

MILLIONS of people are now taking time off from worrying about the prospects of atomic warfare to do some worrying on account of the burden of a growing national debt. But there are many quite different concepts of the nature of this burden. The purpose of this article is to examine the most important of these worries and to see to what extent they are justified and to what extent they are about imaginary burdens which only confuse the real issues.

I. IMAGINARY EFFECTS OF NATIONAL DEBT

1. By far the most common concern about the national debt comes from considering it as exactly the same kind of thing as a private debt which one individual owes to others. Every dollar of an individual's indebtedness must be subtracted from his assets in arriving at a measure of his net wealth. Indebtedness is impoverishment. It places the debtor in the hands of the creditor and threatens him with hardship and ruin. To avoid indebtedness as far as possible is undoubtedly an eminently well-established rule of private prudence.

The simple transferability of this rule to national debt is denied by nearly all economists. But nearly everybody who has ever suffered the oppressions of private indebtedness is tempted to apply the analogy directly, and the primary orthodoxy of the editorial writers, the dogma that sound government finance means balancing the budget, has no other basis.

One of the most effective ways of clearing up this most serious of all semantic confusions is to point out that private debt differs from national debt in being *external.* It is owed by one person to *others.* That is what makes it burdensome. Because it is *interpersonal* the proper analogy is not to national debt but to *international* debt. A nation owing money to other nations (or to the citizens of other nations) *is* impoverished or burdened in the same kind of way as a man who owes money to other men. But this does not hold for national debt which is owed by the nation to citizens of the *same* nation. There is then no external creditor. "We owe it to ourselves."

This refutation of the validity of the analogy from *external* to *internal* debt must not be interpreted as a denial that any significant problems can be raised by internal national debt. When economists are sufficiently irritated by the illegitimate analogy they are liable to say that the national debt does not matter at all. But this must be understood in the same sense as when a man who finds that rumor has converted a twisted ankle into a broken neck tells his friends that he is perfectly all right.

2. A variant of the false analogy is the declaration that national debt puts an unfair burden on our children, who are thereby made to pay for our extravagances. Very few economists need to be reminded that if our children or grandchildren repay some of the national debt these payments will be made *to* our children or grandchildren and to nobody else. Taking them altogether they will no more be impoverished by making the repayments than they will be enriched by receiving them.

Unfortunately the first few times people see this argument destroyed they feel tricked rather than convinced. But the resistance to conceding the painlessness of repaying national debt can be diminished by pointing out that it only corresponds to the relative uselessness of incurring it. An *external* loan enables an individual or a nation to get things from others without having to give anything in return, for the time being. The borrower is enabled to consume more than he is producing. And when he repays the external debt he has to consume less than he is producing. But this is not true for *internal* borrowing. However useful an internal loan may be for the health of the economy, it does *not* enable the nation to consume more than it produces. It should therefore not be so surprising that the repayment of internal debt does not necessitate a tightening of the belt. The internal borrowing did not permit the belt to be loosened in the first place.

3. Many who recognize that national debt is no substraction from national wealth are nevertheless deeply concerned about the interest payments on the national debt. They call this the *interest burden* almost as if the interest payments constituted subtractions from the national income.

This involves exactly the same error. The interest payments are no more a subtraction from the national income than the national debt itself is a subtraction from the national wealth. This can be shown most clearly by pointing out how easy it is, by simply borrowing the money needed to make the interest payments, to convert the "interest burden" into some additional national debt. The interest need therefore never be more onerous than the additional principal of the debt into which it can painlessly be transformed.

Borrowing money to make the interest payments sounds much worse than simply getting into debt in the first place. Popular feeling on this score seems so strong that economists who are themselves quite free from the erroneous analogy have felt themselves constrained by the power of the prejudice to assume that the interest payments on national debt are never borrowed but raised by taxes.[1]

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[1] E.g., Evsey D. Domar, "The Burden of the Debt and the National Income," *American Economic Review*, December, 1944, p. 799. "This assumption (that all funds for payment of interest charges are to be raised by taxation) is made both to simplify the argument and to protect the reader from a shock. To many, government investment financed by borrowing sounds so bad that the thought of borrowing to pay the interest is simply unbearable." (Reprinted by permission.)

The strict application of such a secondary orthodoxy would mean much more than these economists intend to concede to the popular prejudice. It would mean nothing less than the prohibition of all borrowing, and a meticulous adherence to the primary orthodoxy of balancing the budget at all times. For as soon as there is any national debt at all on which any interest has to be paid, *any* further government borrowing is indistinguishable from borrowing to pay the interest—unless we are taken in by bookkeeping fictions of financial earmarking which say that the money borrowed goes for other purposes so that the particular dollars used to pay the interest come from taxation.[2]

4. Once the analogy with external debt is removed from the scene it is possible to consider various alleged effects of national debt on the economy to see whether they are real or important.

One of these is an alleged deflationary effect of the interest on the national debt. If the money to pay the interest is raised by additional taxes, these would probably reduce spending by more than the interest payments would increase spending. The net effect would be to aggravate any existing deficiency of spending or to alleviate any existing excess of spending. It would tend to deepen a depression or to mitigate an inflation.

But this deflationary effect is not really the effect of the interest payments. It only appears to be such because of a silent acceptance of the secondary orthodoxy of not borrowing to pay interest, but raising the money by additional taxation.[3] The deflationary effect of such additional taxation is then misleadingly attributed to the national debt or to the interest payments.

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[2] If we did permit ourselves to indulge in such make-believe, the secondary orthodoxy would be reduced to declaring that everything is all right as long as the interest paid on the national debt does not exceed the total tax revenue. It could then be declared that the interest payments all come out of taxes even if all other expenditures are financed by borrowing!

[3] This is on a third interpretation of the secondary orthodoxy which would call for an *increase* in tax revenue to match any *increase* in interest payments on the national debt. While this is perhaps more in accord with the feelings behind the injunction, it is supported by neither reason nor tradition and fails to give a practical guide because there is no way of knowing what would be the level of tax revenue in the absence of the national debt.

With the unmasking of the implicit secondary orthodoxy it becomes clear that the interest payments are *inflationary*. They constitute additional income to the recipients and *increase* the rate of spending. If any additional taxes are imposed, their normally deflationary effects must of course be taken into consideration; but there is no reason for attributing these effects to the interest payments, since we need not impose such taxes if their effects are not desired.

5. The rational alternative principle to the orthodox one of balancing the budget, which means keeping tax revenues equal to government spending, is the Functional Finance principle of keeping total spending in the economy at a level which is high enough to prevent depression yet low enough to prevent inflation.

This is to aim policy *directly* at the real problems in terms of which any policy—including the orthodox policy of balancing the budget—must ultimately be justified: the prevention of both inflation and depression.

Whether the budget will be balanced or underbalanced or overbalanced will then be a *result*, more or less foreseen, of the application of the Functional Finance principle, depending on which of these is necessary for the prevention of inflation and depression.

Our main problem can then be reformulated in this way:—Could we get into serious trouble from real effects of a growing national debt if we follow the principle of Functional Finance?

II. REAL EFFECTS OF NATIONAL DEBT

6. Since the interest payments on the national debt increase private spending, a fiscal program which would have led to the right level of total spending in the absence of the national debt and the interest payments on it would now result in too much spending. Any increase in national debt (which increases money income and therefore also the spending out of income) must therefore be accompanied by a decrease in government spending or by an increase in taxation (or both). If this involves the abandonment of useful government undertakings or the enactment of harmful

taxes, we really have a bad effect or "burden" of national debt.

This looks somewhat like the secondary orthodoxy which says that the money to make interest payments on the national debt must be raised from taxes, but the resemblance is only superficial. Since Functional Finance is interested only in total spending, it does not care whether the additional revenues from the taxes are equal to the interest payments. If more than an additional dollar is collected from the taxes needed to offset the extra spending due to an additional dollar of interest payments, tax revenue will have to be increased by more than the additional interest payments. On the other hand, if the efficiency of a dollar of tax revenue in reducing spending is greater than the efficiency of a dollar of interest payment in increasing spending, no increase in total spending will occur even though additional tax revenues are less than the additional interest payments.

But it is not really satisfactory to speak of tax revenues at all. Spending is affected by the tax *rates*, not by the tax *revenues*. The revenues are themselves effects of the taxes, and the efficiency of a tax in reducing spending is only indirectly connected with its efficiency in raising revenue. An increase in sales taxes which sharply diminished spending, for instance, might actually reduce the tax revenue. Functional Finance would then be served by additional taxes which offset the spending induced by the interest payments, even though tax revenues would actually be diminished just when the interest disbursements are increased.

7. In attempts to discredit the argument that we owe the national debt to ourselves it is often pointed out that the "we" does not consist of the same people as the "ourselves." The benefits from interest payments on the national debt do not accrue to every individual in exactly the same degree as the damage done to him by the additional taxes made necessary. That is why it is not possible to repudiate the whole national debt without hurting anybody.

While this is undoubtedly true, all it means is that some people will be better off and some people will be worse off. Such a redistribution of wealth is involved in every significant happening in our closely interrelated economy, in every invention or discovery or act of enterprise. If there is some good general reason for incurring debt, the redistribution can be ignored because we have no more reason for supposing that the new distribution is worse than the old one than for assuming the opposite. That the distribution will be *different* is no more an argument against national debt than it is an argument in favor of it.

8. The growth of national debt may not only make some people richer and some people poorer, but may increase the inequality of distribution. This is because richer people can buy more government bonds and so get more of the interest payments without incurring a proportionately heavier burden of the taxes. Most people would agree that this is bad. But it is no necessary effect of an increasing national debt. If the additional taxes are more progressive—more concentrated on the rich—than the additional holdings of government bonds, the effect will be to *diminish* the inequality of income and wealth.

9. There are also effects on investment. Additional taxes reduce the net yield from investment, after taxes, and make socially useful investments unprofitable to the investor.

This effect is cancelled whenever there is the possibility of balancing losses against profits for tax purposes. If such offsetting were universally possible the taxation would not discourage investment at all.[4] But the opportunity of loss offset is not universal, so that the interest payments on the national debt, by making more taxation necessary for the prevention of inflation, interferes with the efficiency of the economy by discouraging useful investments.

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[4] See "Functional Finance and the Federal Debt," *Social Research*, February, 1943, (reprinted in *International Postwar Problems*, October, 1945) and "An Integrated Full Employment Policy," *International Postwar Problems*, January, 1946, and reprinted in Lerner and Graham, *Planning and Paying for Full Employment*, Princeton University Press, 1946. On the assumption of perfect loss offset, taxation might even *encourage* investment by impoverished investors willing to take more chances in attempts to maintain their standards, but this does not invalidate the general argument that a social loss is involved. See Musgrave and Domar, "Proportional Income Taxation and Risk Taking," *Quarterly Journal of Economics*, May, 1944.

A failure to consider the cancelling effects of loss offsets is partially responsible for a common exaggeration of the bad effect of national debt on investment. This sometimes takes the form of a vivid nightmare of a vicious circle. Government investment to maintain prosperity by filling the gap left by discouraged private investment is financed by loans which increase the national debt still further. This calls for still more taxes, still greater discouragement of private investment, and the need for still more government investment to prevent depression with still more government borrowing—the cycle going on until by this insidious mechanism the economy is unwittingly led to complete collectivism.

Here it must be pointed out that as long as it is necessary for the government to prevent depression by filling a gap in investment, the economy is suffering from *too little spending*. There is therefore no need for more taxation and its possible bad effect on investment. Such extra taxation is necessary only if the economy is suffering from the opposite trouble—from *too much spending*. The vicious circle, apart from some other weaknesses, depends on supposing the economy to suffer at the same time from too much spending and from too little spending.

10. An increase in national debt, with its accompanying accumulation of government bonds by the individuals to whom the debt is owed, can make the owners of the government bonds less willing to work. One of the reasons for working, the earning of money to put away for a rainy day, is weakened (from the point of view of these bondholders) because there is more put away already for rainy days.

This has been pointed out as a bad effect of national debt. But work is only a *means* for producing the things that people want and is not desirable as an end in itself. (Any work that is so enjoyed would not be reduced for the reasons here discussed.) The decrease takes place because people *prefer* the leisure to the products of labor, and the change represents an *increase* in the welfare of the people.

The increase in leisure would be accompanied by an increase in consumption, both this and the increased leisure coming out of a reduction in *saving*. This saving which is prevented by the increase in national debt would have taken place not for the sake of permitting an increase in future consumption but for the sake of the security yielded by the savings. It would have made necessary an increase in investment to prevent depression. This shift of resources from consumption (including leisure) to investment is unnecessary, because the desired security is provided without it by the ownership of the additional national debt. Anybody who still wants to save for the sake of the interest yield (reflecting the marginal efficiency of investment) is free to do so. But the increased consumption and reduced efforts by people who are enjoying the ownership of government bonds is merely the result of the elimination, by the national debt, of an uneconomic, because undesired, shifting of resources from present to future uses.

Of real importance is the consideration that the taxes necessary to offset the inflationary effects of the interest payments may reduce the net reward for work below the value of the marginal net product. This would reduce the amount of work done below the optimum, and constitute a real impairment of the efficiency of the economy.[5]

11. The effects of the national debt in discouraging its owners from working and in necessitating anti-inflationary taxes which may reduce the reward for work and for investment can be dramatized by imagining a fantastically large national debt.

If the national debt is so large that the interest on it comes to many times the national income from work (and if the interest payments are fairly widely distributed among the population), very little work will be done over and above that which is done for the pleasure of doing it.

This in itself is not anything bad. If such a state of affairs could be maintained without heavy taxation (which will be discussed below), nearly all goods will be free, and we will have approached the ideal of plenty where Marxism and Anarchism converge and economy is no longer necessary. This is perhaps not quite as far of attainment as one tends to suppose. In a rich country like the United States, if everybody had such an accumulation of government bonds that conspicuous consumption and display lost their significance, needs of material goods could be so simplified and reduced as to make their complete satisfaction feasible by the few hours' work that are necessary for health or may become necessary for social approbation.

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[5] The fact that our economy is not perfectly competitive, so that workers receive less than the value of their marginal product in any case, only increases the amount of harm that would be done by taxes which would reduce the net reward for work still further below the value of the marginal net product.

The age of plenty is, however, not imminent. An income from interest on the national debt many times as large as the income from other sources would result in expenditure on goods and services many times as large as the available supply of goods and services. There would therefore have to be very heavy taxes to keep the demand from exceeding the supply and thus bringing about inflation. If these taxes approached 100 per cent of the income, they would so reduce the net reward for effort that all work producing income subject to the tax (either when earning it or when spending it) would come to a stop, and the whole economy would break down. The continuation of life would depend entirely on the degree to which black markets could avoid the taxation, for only such activities would be worth while. Such heavy taxation would be much more destructive than the inflation from which it was supposed to protect the economy.[6]

III. THE EQUILBRIUM LEVEL OF NATIONAL DEBT

12. Although this shows that too large a national debt can be a most serious matter, it does not mean that Functional Finance has to be supplemented by additional precautions to prevent the national debt from growing too large. Functional Finance does this *automatically*.

A tendency to depression exists only when people do not spend enough—they are too eager to save. The amount they would save if fully employed is greater than the amount privately being invested, so that unless the government augments investment or consumption expenditure we have a depression which prevents people from saving more than is being invested.

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[6] I am indebted on these points to correspondence with Richard A. Musgrave.

The people want to save so much because they do not have enough already saved up. The growth of national debt is an increase in the holdings of wealth, the past savings of the people, and so it relieves the pressure to save. If we assume that the government borrows the money for its augmentation of spending,[7] there is an automatic growth of the national debt as long as people want to save more than is being invested. This goes on until an *equilibrium level of national debt* is reached when people are so rich in claims to wealth that they no longer want to save more than is compatible with the maintenance of full employment with a balanced budget. At that point the application of Functional Finance calls for a balanced budget, and the national debt will not grow any more.

If the national debt is above the equilibrium level, Functional Finance calls for an overbalanced budget to prevent the excess demand for goods that this would bring about. The budgetary surplus could then go to repaying some of the debt, and so again there will be a tendency for the equilibrium level of national debt to be approached—this time from the other side.

This balancing of the budget is a *result* or symptom of long run equilibrium. The error of those who cling to the fiscal principle of balancing the budget lies in their prescribing as a *rule* for the short period what is properly only a *result* of the achievement of long period equilibrium.

If we assume a national debt many times greater than the equilibrium level, the taxes needed to prevent inflation may have to be so heavy, and their effects on the efficiency of the economy so pernicious, that this Functional Finance cure for inflation would be worse than the disease. Other and more drastic measures may then be proper, such as a capital levy to reduce the national debt once for all to something near the equilibrium (where Functional Finance could manage it) or perhaps to achieve the same thing by permitting inflation to wipe out the excessive national debt. In such an extreme situation the normal operation of Functional Finance may not be adequate.

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[7] We shall see below that this is not the only or the best way of reaching an equilibrium. The assumption that budget deficits must be covered by borrowing is due to an even greater phobia against simply reducing monetary stocks and issuing more money if these should be exhausted. Mr. Musgrave, in correspondence, has aptly called this the tertiary orthodoxy.

It is, however, important to remember that such an extreme situation could never be the result of Functional Finance because Functional Finance would not permit so great a movement beyond the equilibrium level in the first place. Functional Finance, if it is not given too great a job, works steadily to move the economy toward the equilibrium where the budget would be balanced. From that point there would be adjustments only to the extent that the equilibrium position is affected by movements in the level of income, the age distribution of the population, the distribution of wealth in the population, and other such slow moving secular determinants.

13. It should be noted that the equilibrium level of national debt is quite different from the "manageable" or "reasonable" levels of national debt which Professor Hansen and others insist on as limits to guide us in fiscal policy. The latter limits are *prescribed* limits which we are told not to pass because of dangers that lie on the other side. Sometimes they are accompanied by prognoses and estimates which indicate that there will be no tendency for these limits to be passed by a policy of maintaining full employment by borrowing to maintain adequate demand. But essentially they are signposts to guard against the dangers of permitting the national debt to go beyond the "manageable" or "reasonable" limit. Our equilibrium level is not a prescribed limit to policy. It describes an automatic tendency for the national debt to reach an equilibrium if we do nothing about it except merely follow the basic Functional Finance principle of keeping total demand at the proper level to prevent inflation or depression.

14. The equilibrium level of the national debt, with its balanced budget, is reached when the Functional Finance policy of preventing inflation and depression results in a yield from taxes just sufficient to pay all the expenses of government including the interest payments on the national debt.

These taxes may have serious effects on the economy even before the equilibrium level of national debt is reached. If there is not a proper arrangement for loss offset, the taxes may interfere seriously with useful investment. If the taxes fall heavily on the reward for marginal effort, they will prevent useful work from being done, diminishing the real level of national income. If the government has to restrict its own expenditures, many socially useful undertakings will be killed in the efforts to prevent inflation. And the diminishing desire to work, accompanied by an increasing desire to spend (which accompanies the growth of individual wealth in the form of ownership of national debt), will decrease the supply of goods on the market even while it increases the demand for them. Even though this last item must not be counted as a social loss, it does contribute to the inflationary pressures, and necessitates more taxation and greater government economies, both of which can mean real diminutions in the national income.

It is true that all these bad effects come only from the imposition of "bad taxes." If the additional taxes did not fall on the income from additional effort, the bad effects would be avoided. But it is probably impossible to avoid all "bad taxes," especially if the good ones are already being exploited to the utmost—so that the problem cannot be dismissed by simply recommending good taxes instead of bad taxes.

It is conceivable that even before the equilibrium level of national debt is reached a vicious circle would be encountered in which additional taxation failed to check the increasing inflationary pressure because, by its interference with the reward for extra effort, it reduced supply more than it reduced demand.

In such an extreme and very unlikely situation, there is a very easy and extremely satisfactory way out. The solution is to *reduce* taxes. This would increase supply more than it increased demand, and so would work to check the inflationary pressure even while it raised the national income.

More serious is the less extreme case where taxation reduces supply seriously but not more than it reduces demand. The tax increases needed to check the inflation might so reduce the efficiency of the economy and the real income that it would be better to suffer the evils of inflation. It may even happen that the increased tax rates resulted in a diminished yield because of the reduction in output so that the budget, instead of getting nearer and nearer to balancing, got more and more unbalanced. As the difference is added (we assume) annually to the national debt, the interest payments would increase year by year, while the tax collections lag further and further behind the government expenditures (including these interest payments) so that there is no tendency to equilibrium. The national debt would grow indefinitely—ultimately leading to all the evils of national debt much greater than the equilibrium level.

15. All these troubles not only assume extremely bad taxes, but depend on a basic misunderstanding of the function of government borrowing. The government is supposed to fight chronic depression by expenditure of money which it borrows at interest, so continually increasing the national debt until it becomes "unmanageable." Borrowing is thus seen as an inflationary activity, necessary to combat the tendency to chronic depression, and later necessary to raise the money to keep up interest payments on national debt even when the danger is one of inflation rather than of depression.

But borrowing is not inflationary. It is deflationary. It looks inflationary only if one fails to distinguish it from the expenditure of the borrowed money. This expenditure is more inflationary as a rule than the borrowing is deflationary, so that the net effect of the borrowing-plus-spending is inflationary.

Borrowing is deflationary because it takes money out of the hands of the lenders and puts government bonds there instead.

People are somewhat less likely to want to buy other things when they have spent their money on government bonds. The sale of government bonds diminishes liquidity, tends to raise interest rates, and discourages investment. The government should therefore not borrow unless it wishes to bring about these deflationary effects. It can keep on making all the expenditures and investments it finds desirable without borrowing, merely by paying for these out of its stocks of money or creating new money if it should run short.

16. The government should therefore not borrow any money until the economy has passed out of the range of threatening depression into the range of threatening inflation. This will occur even without any incurrence of national debt simply as a result of the increase in the amount of money which gets into the hands of the public as the government spends it. As the amount of money in the hands of the public increases, the public feels itself wealthier —just as if they had more government bonds or other property. This is part of the "wealth effect." It diminishes the tendency to save, and to work for the sake of saving, and increases demand while it diminishes supply. The owners of the money do not get interest on their holdings as they would if there had been an increase in national debt instead of an increase in the amount of money. But in place of this there will be the increased liquidity of the economy, tending to lower the rate of interest, and thus to increase investment—and perhaps also some spending out of income by such as are discouraged from saving by the fall in the rate of interest. Instead of the "income effect" that would accompany the interest payments on the national debt there will be the "liquidity effect" of the increase in the amount of money, also tending to increase total demand. This is the other equilibrating mechanism. When the amount of money has increased sufficiently the deficiency of demand which called for the government deficit will have to come to an end, and the volume of money will cease to grow. Full employment is maintained by an equilibrium level in the amount of money. There is no danger of in-

flation from the increase in the amount of money because the first signs of inflation are at the same time signs that the increase in the amount of money has gone too far. It will be a sign that the government must spend less money than it collects in taxes (or otherwise), and so bring back the amount of money to the equilibrium level.

17. The effect of government borrowing (in the sense of simply borrowing, not borrowing-and-spending) is to diminish the liquidity of the economy, to raise the rate of interest, and to discourage investment. The government should therefore borrow only when it wishes to diminish liquidity. This will happen whenever the government thinks it better to check low-yield investment than to check consumption by imposing more taxes, or to check useful government expenditures. Borrowing is a deflationary instrument like taxation and government economy, competitive with these in the battle against inflation.

But while the *act* of government borrowing is deflationary, the resulting *fact* of the existence of government debt is inflationary, because of both the "wealth effect" and the "income effect" on spending. The "wealth effect" is also produced by the *fact* of existence of money. If both the national debt and the amount of money increase together, the long period equilibrium will be the result of *both* influences on the rate of spending, and will be reached at the point where the "wealth effects" of both the national debt and the amount of money, together with the "income effect" of the national debt and the "liquidity effect" of the new money, bring about the required total rate of spending for full employment. The budget is balanced, and neither the national debt nor the amount of money need change any more (except in adjusting to secular changes in the determinants of the equilibrium).

18. The difference between government borrowing and the other deflationary instruments, government economy and taxation, is that while the other instruments have a once-for-all deflationary effect, borrowing only temporarily offsets inflationary

effects until the time when the debt is to be repaid, and then the inflationary pressure returns with interest—literally.[8] And even before the debt is repaid, and even if the debt is destined to remain on the books indefinitely, the inflationary pressures come back in the form of inflationary interest payments in the "income effect" of the national debt and the constant "wealth effect" from the mere existence of the national debt. The deflationary effect of government borrowing is weaker than that of the other instruments, partly because it is offset by the inflationary effects of the extra national debt which follows every dollar of government borrowing.

What this means is that government borrowing is not a real alternative to taxation or economy, but only a way of postponing these really deflationary instruments to a more convenient time in the future. Exactly the same relationships hold in reverse for the repayment of debt with its immediate inflationary effect through the increase in liquidity and its long run deflationary effect from the absence of the liquidated national debt.

19. The importance of this peculiarity of government borrowing as a deflationary instrument (and of repaying debt as an inflationary instrument) comes to light when we consider some attempts to derive rules for policy about national debt. It is pointed out for example that it is better for an economy to have a smaller rather than a larger national debt because the "wealth effect" and the "income effect" of the larger national debt cause more spending so that more taxes are necessary to prevent inflation. Since the taxes are not ideal taxes, they will to some extent fall on the marginal pay for effort, and they will also discourage useful investment and useful government spending. The national debt thus has a bad effect.

But is this remark of any use as a guide for policy? Hardly at all. For it is surely not intended to suggest that the debt or a part of it should be repudiated. The effects of this particularly arbitrary form of taxation would certainly be worse even than the imperfect taxes needed to prevent inflation, the bad effects of which it is hoped to avoid. Nor can it be intended to suggest that the borrowing should not have taken place in the past, if this borrowing was considered less harmful than the alternative deflationary instruments of taxation or government economies at the time. At the most it can tell us that the borrowing, which meant a postponement of the taxation or economy, was not wise if the taxation and economies would do more harm in the future than at the time from which they were postponed. The postponement was then a mistake. But that surely is no *general* reason for not incurring debt, since the postponement can very well be a very good policy. Certainly it is not intended to argue that it is better to permit unemployment if its prevention entails borrowing (the issue of new money being too shocking). Yet this is the lesson most likely to be derived by practical politicians from careless declarations that it is better to have a smaller than a larger debt. The statement is of the same category which says that it is better to have a larger than a smaller national income. Until it is shown what measures are proposed to increase the national income or to decrease the national debt, the statement is academic in the worst sense of the term.

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[8] Government economy can be temporary too if it consists of the postponement of necessary replacements which will only accumulate in the future. Such "economies" can be considered as equivalent to "borrowing" from the deteriorated equipment which will demand "repayment" in the future, perhaps with very high "interest."

The national debt cannot be made smaller by just wishing it so. It can be reduced only by repudiation, or by increased taxation, or by increased government economies on what are presumably useful activities. All of these steps immediately bring about in a more severe degree the very evils which the existence of the national debt threatens in the future.

IV. NATIONAL DEBT AND NATIONAL WEALTH

20. It might be supposed that national debt could be avoided if appropriate and wise fiscal policy would result in *private* borrowing and investment taking place instead of government borrowing and investment or other expenditure. (This is independent

of whether the activity is conceived as helping to prevent depression by providing investment, or helping to prevent inflation by borrowing.) There will then be no government debt. Is this a way in which the evils of national debt could be avoided without giving up the fight to prevent inflation and depression?

To suppose this to be the case is to make a most serious mistake. For the whole of the analysis of this article, *all* the effects of government borrowing and of national debt apply just as much to private borrowing and to private debt. We have seen that what is important about national debt is that individuals feel rich and have more income—the "wealth effect" and the "income effect." These effects are just as much in evidence if the public, instead of owning government stock, owns stock in the private corporations which have done the investing instead of the government. The ownership of shares in private corporations has just as great a "wealth effect," and insofar as the yield in private investment is on the average greater than the interest on government bonds, it has a greater "income effect" even after allowing for bankruptcies. There will therefore be at least as great an inflationary pressure as if there had been the same amount of national debt; at least as much taxation will be necessary to prevent inflation, and at least as much harm will be done to the efficiency of the economy as in the other case. The evils cannot be avoided by having private instead of public debt.

All the other arguments developed above in relation to national debt will also be applicable in the same way to private debt. There will be an equilibrium level of *wealth* in the long run which will permit a balancing of the budget, though the wealth will consist of public and private debts, as well as money and real, physical goods.

Against this it has been argued that private investment results in an increase in the output of goods in the future to match the increase of demand out of the income of the recipients of dividends. But public investment may be just as useful in increasing future output, and it often may be more useful. Of course it is better to have useful private investment than useless public investment. It is similarly better to have useful public investment than useless private investment. In fact it is simply better to have relatively useful investments than relatively useless investments, irrespective of whether they are public or private. But this residual proposition is not really very helpful.

21. A final argument takes the form of pointing out that private investment is always built on the expectation of being able to charge sufficient for the product to be able to pay dividends to the shareholders, while public investment is often directed to enterprises which, however useful they may be socially, do not collect sufficient from the consumers to pay the whole cost of the investment and the interest on the money invested. Indeed it is just such enterprises which do not permit the consumer to be charged the whole cost of the undertaking that are by definition the Public Utilities which tend to be run by public enterprise. It is therefore true that private enterprise is more likely to be less inflationary in the long run than public enterprise, and to need less taxation to prevent inflation.

But it does not in the least follow from this that it would be better to encourage private enterprise to undertake fully self-liquidating enterprise than for the government to undertake activities which are equally useful but would make more taxation necessary. For if these useful "Public Utilities," instead of being undertaken by the government and run on the socially most desirable scale (which results in losses and the need for more taxes), are undertaken by private enterprise (which will do so only if they can apply at least enough monopolistic restriction to get a normal return on their investment), the price will be raised above the marginal social cost to the average private cost. This inflicts exactly the same kind of social loss on the economy, interfering with its efficiency in serving the needs of the consumers, as is done by a very bad tax. Since the taxes imposed to prevent inflation are at least designed to some extent to avoid the evils of bad taxes, it would be most unreasonable to prefer the clearly bad "taxes" imposed by monopolists to make "Public Utilities" self-liquidating.

22. We see then that the kinds of evil most popularly ascribed to national debt are wholly imaginary; that some less serious evils are more real, but are not to be avoided by the obvious policies of avoiding national debt; and that the direct application of the basic principles of Functional Finance are an adequate general guide to fiscal policy. If the short run equilibrium is taken care of so that there is neither too much spending nor too little spending, and so neither inflation or depression, and a normal amount of reasonableness is applied in choosing between the different ways of achieving this short run equilibrium, the long run equilibrium of the size of the national debt will look after itself.

III

Carl Dietzel, Public Expenditures and the Public Debt

BY

WALTER F. STETTNER

I. INTRODUCTION

THE PREVAILING attitude toward government expenditures and the public debt still reflects the influence of the British classical economists. Sometimes this influence is explicitly stated by contemporary writers; more often it is merely implicit in their approach.

The opposition of the classical writers to government expenditures in general, and to public borrowing in particular, has been a serious obstacle to a penetrating and dispassionate study of the subject. Insufficient attention has been given to whether or not their theories, expounded over a century ago, are germane to current issues. And it has been almost completely overlooked that even in their own times their views on government financing did not correctly interpret the needs of the day; hence, they proved useless as a guide to public policy. The "fiscal" doctrines of the classical writers consistently lagged behind events. The history of British public credit during the eighteenth and nineteenth centuries repeatedly refuted their dire predictions as to the economic consequences of a growth in the public debt; and its actual course would certainly have differed significantly had the classical views been adhered to in financial policy.

The views of the classical writers did not go unchallenged even in Great Britain. It was one of the great merits of Lord Keynes that he called attention to the soundness of several "unorthodox" writers in the earlier literature. In particular he gave new credit to T. R. Malthus who, at a time when his fellow economists were primarily concerned with the problems of capital accumulation, emphasized the importance for the wealth and progress of a nation of adequate demand for the annual product. Malthus' views on the public debt challenged the classical doctrine in several respects, and contained some original thoughts which bring him close to modern views. They have received scant attention, however, and are looked for in vain in textbooks on public finance where the views of Smith, Ricardo, and Mill are fully discussed.[1]

A more basic attack on the British public debt views was made by the German contemporary of John Stuart Mill, Carl Dietzel.[2] Dietzel was familiar with the problems and conditions confronting the British classical economists. At the same time, the strikingly different political and economic situation of nineteenth-century Germany afforded him a broader perspective from which to study the problem.

It is the purpose of this essay to appraise some of the flaws of the classical doctrine on government spending and borrowing, as brought out in the work of Carl Dietzel, and to examine his alternative approach to the theoretical basis underlying public financial policies. By thus speaking through a contemporary critic rather than from the vantage point of one hundred and fifty years of history, it is hoped to avoid the charge of hindsight and to keep the approach within the setting of the period.

The question which Dietzel determined to answer was this: Is the amazing economic development of Great Britain a consequence of her credit system, is it a consequence of other developments which occurred simultaneously with the development of the credit system, or has it occurred in spite of the use of public credit?

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[1] This writer has called attention to the views of another "heretic," Sir James Steuart, who at the time of Hume and Smith held views on the public debt which differed in important respects from the classical doctrine. Cf., "Sir James Steuart on the Public Debt," *Quarterly Journal of Economics*, Vol. LIX, May 1945.

[2] Carl Dietzel (1829–1884), *Das System der Staatsanleihen im Zusammenhang der Volkswirthschaft betrachtet*, Heidelberg, 1855.

He found the answer given by the British classical economists unsatisfactory, and concluded:

> Convinced that a persistent contradiction between the facts and the teachings of the systems is due rather to onesidedness of the latter than to an absurdity or inconsistency of the former, we shall try to present the state credit and its application as a system, as a necessary occurrence of higher economic development, the "state debt" as an indication of the wealth of the nation.[8]

The result was what is probably the most penetrating and original theory of the public debt of his century. Dietzel's views not only throw interesting light on the shortcomings of the classical position, but mark an important step in the evolution of modern thinking on the public debt. In addition, they provide a convenient starting point for a reconsideration of current analysis of the problem, intended to free it from the anachronistic remnants of classical doctrine.

Section II will present a summary and appraisal of Dietzel's views on the public credit and his criticism of the British classical economists. In Section III one particular aspect of Dietzel's theory will be considered, namely his concept of productivity and its relevance today for a consistent interpretation of the proper role in fiscal policy of loan-financed public expenditures.

II. DIETZEL'S THEORY OF PUBLIC CREDIT

The Flaws in the British Doctrine

Two crucial errors, according to Dietzel, were primarily responsible for the hostile attitude of the British classical economists toward the public credit: the theoretical separation of the government economy from the general economy, and a fallacious concept of productivity.

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[8] *Ibid.*, p. 20.

For the classical writers, the economy was nothing but a summation of the private productive efforts of individuals. They overlooked the important contribution which the government makes to economic pursuits, for instance, by maintaining the legal order. Goods consumed by the government were considered to be withdrawn from the economy for unproductive use.

Dietzel redefines the term economy as the *combined* efforts of individuals for the satisfaction of their needs. He felt that the public economy and the individual economies have inseparable and equally important functions in maximizing satisfaction. Since certain goods cannot be produced by the individual economies, the collective economy is necessary to produce these particular goods in the interest of all.

Like the classical writers Dietzel set definite limits to the field of public activity, while at the same time broadening its scope. The activities of the public economy should be limited to those areas for which it is particularly suited, leaving to the individual economies tasks which they can perform equally well.

Because of the nature of its purposes the public economy develops more slowly, and later, than the individual economies. Its growth is closely related to the development of the constitutional state, and to the view that all individuals in an economy are at the same time members of a state which exists in their common interest. It follows the development of the individual economies which, in their more advanced stages, require the protection afforded by the political order, and the cooperation and support of public institutions. At the same time, as wealth increases, there is a growing demand for the special goods and services produced by the public economy.[4]

For reasons which will become apparent later, the concept of productivity plays a fundamental role in Dietzel's public credit theory. He takes exception to the formulation of the classical writers who developed the concept in connection with their general value theory, and he objects to its implications with regard to the

[4] *Ibid.*, p. 78.

role of public expenditures. Productive labor requires for its undisturbed activity protection against destructive external forces. These forces may be either natural or the result of human violence. Classical doctrine drew an erroneous distinction between outlays for protection against natural elements, such as for warehouses, clothes, and barns, and outlays for protection from human violence, such as the police and army. The former were considered productive, the latter unproductive.

Dietzel found this a completely arbitrary distinction. He felt that goods threatened with destruction, but saved through outlays on protection, should be looked upon as new goods.[5] Hence all expenditures incurred for the purpose of protection must be considered productive. The state is the most important institution for the protection of the economy against the destructive effects of human violence, and all its expenditures for this purpose are therefore productive.

Dietzel's Concept of Immaterial Capital

Dietzel's reinterpretation of the relation between the public and private economies and his different views on productivity are reflected in his concept of capital. In his opinion the classical concept of capital was too narrow, in that it related exclusively to physical objects owned by individuals. Smith, for instance, defines capital as the material goods from which individuals expect an income. Dietzel expands the concept to include not only the capital of the individual economies, but also of the public economy; not only material goods, but also immaterial capital.

The concept of "immaterial capital" is fundamental to Dietzel's analysis. He points out that something can be capital without being of material or physical substance. It can be an addition to the material capital, such as the artistic features of a bridge or a public building, or it can exist independently, as the legal arrangements which have a beneficial effect upon the economy and increase its productivity. All transformations of material goods into immaterial capital presuppose such a level of wealth in the economy that the necessary material goods can be spared for this purpose.

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[5] *Ibid.*, p. 12.

Like the capital of the individual economies, the *national capital* consists of fixed and circulating capital. The fixed national capital is made up of all public institutions, buildings, works, and equipment which yield permanent uses to the community. They are either sources of immediate enjoyment, such as theaters, museums, and churches, or they are goods which supply services essential in the production of other goods, such as highways, dams, and soil improvements.

The most important feature and purpose of the public economy is the creation of immaterial capital. The state itself is the great immaterial capital of the nation. Its value must be set against the value of the goods consumed in its formation and maintenance. Components of this immaterial capital are the maintenance of the state order, the protection of property rights, the skill and ability of all the individuals from the point of view of the nation as a whole, and all other conditions which have a favorable influence on the production of the individual economies. Public expenditures for education, health, recreation, and sanitation are designed to increase the efficiency of labor and hence are additions to immaterial capital; likewise outlays for modifying and improving inappropriate and obstructive social institutions.

Dietzel agrees with the classical economists that the course of economic progress is characterized by a continuous increase in the fixed capital of the economy, but he differs by including in this increase the fixed capital of the national economy. As the economy progresses, not only are more goods produced, but goods of a constantly "higher order"—since the market for any one good is limited by the effective demand for it. The economic classes of a nation form a pyramid, as it were, each of them accumulating more capital to meet its particular needs. For the higher income classes this involves the production of new goods in which the immaterial features play an increasingly important role. Since the services provided by the public economy are primarily of an immaterial character, Dietzel concludes that the higher classes are the primary beneficiaries of the national immaterial capital, and it is therefore only natural that they should contribute the means for its increase. However, this should be done only on a voluntary basis.

The Role of Credit

Credit, for Dietzel, is an essential element of economic progress, and a necessary instrument for continued capital accumulation. Credit transforms goods which are in a neutral condition into capital. It, therefore, not only transfers capital, but actually creates it. It enables workers to make use of all capital in existence, thereby securing the highest degree of productivity in the economy possible at any given time. And it promotes a continuous and unlimited expansion of capital by enabling those who are not in a position to use their newly created disposable capital themselves to derive a benefit from it.

At the top of the whole credit structure of the economy stands the public credit. It supplements private credit by making it possible for the whole capital in the economy to be productively employed at all times. Its function is to transfer to the collective economy capital which does not find adequate investment opportunities in the individual economies.[6] Also, it brings together the capitals necessary for the important purposes of the public economy. The transaction is purely voluntary and rests on the belief of both parties, the state and the individual, that the capital can be used more effectively by the former. The economic source of the interest payment, as in the case of private credit, is the greater productivity of the economy resulting from these investments. And the opportunity for investment in the public economy is an inducement to save for those who would not otherwise have done so. For both of these reasons, the public economy promotes the growth of capital and productivity.

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[6] *Ibid.*, p. 122.

A system of public loans is an economic necessity for countries in an advanced stage of economic development in which capital cannot always find employment easily and is in danger of being dissipated. Under these circumstances public credit is an essential condition for economic progress. It brings about the optimum relation between the capital of the individual economies and that of the collective economy. Finally the public credit makes it possible to utilize foreign capitals to a much greater extent. Dietzel considers it a strong bond whereby all nations are united into a world economy with the capital of the world being used in the most advantageous manner for the common benefit of all. As Dietzel puts it, the state credit forms the coping stone of the whole credit structure, and indicates the highest stage of economic development.[7] This he points out, is confirmed by experience, since Great Britain and France, the two countries which had made the greatest use of public credit, were also the ones which were economically most advanced.

The "Intellectual and Moral Foundations" of Public Credit

In Dietzel's view public credit has a much stronger foundation than private credit. The important source of strength of public credit lies in its intellectual and moral roots—in the confidence of the creditors in the willingness of the state to meet its obligations. Thus public credit rests on a firmer basis than private credit, substituting the collective appraisal of all capital owners for that of a single creditor. This confidence of the lender is not based primarily on the government in power at any particular time, but rather on a belief in the continuity of the state and the financial ability and integrity of its citizens. The government acts only as the *intermediary* between the lenders and all members of the state, who are the actual beneficiaries of the borrowed capital.

Once the public credit has come into existence, it finds its main support in itself, i.e., in the interest of the state in maintaining its credit. The strength of its credit depends upon the position of the

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[7] *Ibid.*, p. 140.

state and its political system. In its effect on public credit, the state constitution corresponds to the legal compulsion on which the private credit rests. A good constitution promotes the wealth of the people through its effect on the public credit. At the same time the public credit promotes economic and social stability and assures the continuity of the existing constitution by rallying large segments of the people to its support in order to safeguard their investments. Thus, in contrast to private credit, the public credit can grow the more, the greater the size of the existing debt; and the state which is most in debt can be the most powerful. This, according to Dietzel, explains the apparently paradoxical statement that a state should incur debt in order to enjoy good credit standing.

To be in a position to increase the public debt, however, a nation must be progressing economically. Only then will the use of capital by the public economy and the increase of the fixed national capital not have adverse effects on the individual economies, and only then can the additional interest payments be easily borne. In a stagnating or declining nation public credit deteriorates, and the debt should not be increased.

Dietzel is not impressed by the argument that public credit is open to abuse. He recognizes that the same is true of most institutions, and that the greater the benefits of an institution, the greater the possibilities of abuse. He points out that even exclusive reliance upon taxation would not be a safeguard against glaring misuse of material resources, as had been shown conclusively by the financial administration of Napoleon I.

The Financing of Government Expenditures

The true nature of public credit, in Dietzel's opinion, was completely misunderstood by the British classical economists. Baffled and frightened by its effects, they were inclined to think of public borrowing as encouraging government extravagance and as a desperate measure of last resort which should be avoided.

This hostile attitude toward public borrowing was in part a consequence of their distinction between the sources of taxes and loans. Taxes, they claimed, were paid from income while loans were supplied from capital. Increased taxes would merely reduce consumption, leaving the capital intact, while loans would weaken the capital and impair future production. Furthermore, since the purpose of public loans was considered unproductive, government borrowing clearly involved a net loss of capital for the economy.

To Dietzel the classical division of the annual product into necessary cost of production and a net surplus from which taxes and the cost of government were financed appeared to be completely arbitrary. He held that the sources of both taxes and loans are the same, namely, the disposable capital which is destined to satisfy human wants, either immediately or sometime in the future. Only disposable capital can be absorbed by public loans, not capital which is already being used for production by the individual economies.

According to Dietzel, therefore, all the expenditures of the state have to be considered as a unity, whether financed by taxes or loans. The function of public credit parallels that of the tax system, and both should be forcefully used as conditions seem to require. The choice between taxes and loans should be made in terms of the best method of achieving the purpose of the public economy. Dietzel felt, however, that since the economic impact of loans and taxes differs, the choice must depend upon the kind of expenditures which they are best suited to finance. Recurrent and normal expenditures for the functioning and maintenance of the state and its institutions (the circulating capital) should be met through recurrent contributions of all members, i.e., through taxes. The circulating capital of the public economy provides goods and services which are completely consumed by the individuals in the course of the year, and therefore must be contributed by them during the same period. Expenditures which lead to a permanent investment in the state or its institutions, on the other hand, including the formation of immaterial capital, should be raised through loans. The interest payments then become part of the normal outlays of the following years and should be raised through taxes. Although rejecting the classical distinction, this approach is likewise arbitrary in that it still relates the proper revenue source to the particular type of expenditure.

When large funds are urgently needed to meet extraordinary needs, loans should be preferred to minimize the disruptive effects on the economy. Because of the compulsory nature of the tax system, its burden should not be increased suddenly, but should be kept as stable and low as possible. A sudden heavy tax might necessitate borrowing by individuals on more unfavorable terms. This might lead to political discontent and cause the economic decline of large segments of the population. Loans, on the other hand, distribute over a longer period of time a burden which would be unbearable for the moment, and withdraw capital from where it can be spared with the least adverse effects.

This does not mean, however, that loans shift the burden to the future while taxes are borne by the present generation. All the capital which is invested in the public economy, both fixed and circulating, is brought forth by the present generation, and its use is paid for through taxes. Each generation, furthermore, is in possession of all the fixed capital in existence at any particular time, and derives benefits from it. Each generation has a moral responsibility to make the best use of its resources. If the purpose of the investment is justified, future generations cannot be harmed. On the contrary, if a high proportion of total government outlays is made up of interest payments on debt, this is an indication of the great amount of national capital in existence.

It follows from Dietzel's interpretation of the function of public credit that there can be no fixed limit to the growth of public debts. The limit is necessarily flexible and indeterminate, depending primarily upon the need and condition of the economy and the quality of its tax system. Nevertheless, several criteria are available as a guide to policy. In particular, there should at all times exist a proper relation between the capital of the individual economies and that of the public economy. If the former are insufficiently developed they may be unable to benefit fully from the investments of the public economy, and the interest burden may become oppressive.

Voluntariness of the public borrowing transaction is the best guarantee that such a disproportion does not arise. It assures that the capital transferred from the individual economies is actually "available," and does not involve a curtailment of the capital supply for private purposes in which it could have been used to greater advantage. Compulsory loans are, therefore, extraneous to the system of the public credit in normal times, and if they become necessary they should be replaced as soon as possible by voluntary loans.

Repayment of the Public Debt

One of the reasons why the British classical economists failed to grasp the nature of public credit was their belief that the same principles applied to the public as to the private credit. They held that for the state, as for the individual, to be completely debt free was the most desirable aim. This notion followed from the failure to recognize the nature of the state, of the public economy, and of credit in general. Several governments in Great Britain introduced schemes designed to put into practice the classical views on complete debt repayment. The transition to true public credit was brought about only by the pressure of events. As Dietzel puts it: "Here again events strode ahead of theoretical understanding; and not until 1829 did even England give up the fruitless endeavor to chase after the phantom of complete debt repayment." [8]

Dietzel saw one basic difference between private and public debt in the fact that the latter does not have to be repaid. In private credit transactions, the return of the loan at an early date, stipulated in advance, is necessary to safeguard the creditor against improper undertakings and the danger of loss of the principal. These considerations, on the other hand, do not apply in the case of public credit transactions. The capital transferred to the public economy and incorporated in the fixed national capital cannot be taken out of it again. At the same time the claim of the public creditor is safeguarded by assuring him a continuous annual interest payment based on the credit of the state, so that repayment to protect him against losses becomes unnecessary.

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[8] *Ibid.*, p. 143.

This does not mean, however, that the individual public creditor has to forego repayment of his capital. The second distinctive feature of public debt is the continuous vendibility of the claims against the state. The funds for repaying the individual creditor are usually derived from the capital which is continuously produced in the economy and is in search of investment opportunities. Debt repayment should therefore be pursued only to the extent necessary to maintain confidence in the public credit. Debt repayment for its own sake is a luxury too expensive to be indulged in, and has no place in Dietzel's system. Debt repayment should always be considered as a means, not an end; it may be desirable under certain conditions, and inopportune and burdensome under others.

The only situation in which debt repayment on a large scale becomes desirable is in the case of a marked disproportion between the capital of the public economy and that of the individual economies resulting from an impairment of the latter. This, for instance, might be the result of a costly war. In such a case war loans should be considered as an anticipation of future taxes and should be repaid at the end of the war. Such repayment is possible only through a considerable increase in taxation. New capital is thereby created in the economy at the expense of immediate consumption. The capital produced by somebody else—in the last resort by all the taxpayers—is therefore the source of the debt repayment, leaving the capital of the national economy unaffected.

The War Debt

The originality of Dietzel's contribution to the analysis of the public debt is also brought out in his discussion of the war debt. The opposition of the British classical economists to the use of public credit for war financing merely reflected their opposition to war itself. They thought that the use of credit makes it easier to plunge recklessly into warfare. Financing of wars through taxation, on the other hand, would, they believed, discourage wars by making people more aware of their burden. Furthermore, less capital would be destroyed, and the economy could recover more quickly. In addition, as soon as the war ended the burden of taxation could be removed without leaving any harmful aftereffects, as would be the case had debt been incurred.

Dietzel rejects this approach to the problem as an illustration of the classical confusion between means and ends. He points out that for the purpose of deciding the best method of financing, wars have to be considered a datum like any other natural event. Once a war has become inevitable, the economist's function is not to make its prosecution more difficult, by maximizing its impact, but rather to devise the best financial schemes whereby the war can be brought to a speedy and successful conclusion.

For this purpose the use of public credit is essential. Only in this way is it possible to put the state rapidly in possession of the necessary capital, and withdrawing it from where it can be spared with the least harm. Dietzel furthermore does not agree with the classical writers that war expenditures are unproductive and result exclusively in a destruction of capital. Their purpose is investment in the immaterial capital of the nation—protection against foreign enemies and the preservation of the institutions of the country. Consequently, war expenditures, like any other public investment outlay, must be considered as part of the general cost of production of the economy. In addition, by encouraging greater efforts on the part of the individuals, they are also likely to promote the creation of physical capital.

The change from a peace to a war economy brings about a revision in individual scales of preference. A larger proportion of the disposable capital is channeled into the public economy to serve needs that temporarily have become more urgent. This involves a limitation of consumption, but at the same time it offers an incentive to more work, and increased production and capital formation to make up for the losses. This is illustrated, as Dietzel points out, by the great boost to British industry and trade experienced during the Napoleonic Wars.

Dietzel has been widely misunderstood and criticized for labeling war expenditures "productive." It is clear, however, from a careful study of his position, that he did not consider it a matter of indifference whether disposable capital were spent for war or for peace pursuits. What he meant, rather, was that there is never a choice between the two. When war breaks out, expenditures for its prosecution are unavoidable and of the first priority. They are essential to protection of life and property; hence they are productive. But he was well aware that war expenditures may involve destruction of the physical capital of the economy. This is obvious from his agreement with the classical economists to the extent that he favors partial repayment of war loans under certain conditions.

Evaluation

Like the British classical economists, Dietzel's main concern in analyzing public credit is with the accumulation of capital and the conditions for economic progress. However, he points to the essential role in this process of the public economy and the need for considering the public and the private economies as mutually indispensable parts of a whole. He broadens the concept of capital and includes public credit as a fundamental element in the economic growth and development of the nation.

In Dietzel's financing scheme public credit is of equal, if not greater, importance than the tax system. Both have equal status in financing public expenditures, which are considered a necessary cost of production. Investment in the public economy is necessary not only for achieving maximum productivity, but also as an outlet for capital which does not find an investment opportunity in the private economy. The benefit which the economy as a whole derives from these investments is the source of the interest payments to the public creditors.

Rejecting the classical postulate of complete debt repayment, Dietzel considers the conditions necessary for a continuous growth of public credit. Limits to the size of the public debt are related to the national income and the character of the tax system, and the primary criterion is the achievement of a proper relation between the capital of the public and the private economies. Debt repayment is subordinated as an issue. In its role as debtor Dietzel conceives of the state as merely an intermediary between the creditors and the rest of the citizens.

In stressing the investment opportunities offered by the public economy, the role of loan-financed public expenditures in economic progress, and economic balance and stability as the relevant considerations in debt management, Dietzel parts company with the classical writers and anticipates many of the tenets of modern fiscal policy. However, there is no evidence that he faced squarely the issue of loan financing in relation to unemployment.

According to Dietzel, the reason why capital is in search of investment opportunities in the public economy is that with the increasing wealth of the economy the wealth of the potential consumers is not increased to the same extent as the productive ability of the producers. This leads to a disproportion between supply and demand, and the absence of effective demand puts a limit to the production of goods of the same type. It is therefore necessary to invest in the production of new goods of "higher order." These are provided by the public economy. However, Dietzel makes no reference to the fact that the employment offered by public production supplies additional purchasing power for goods produced by the individual economics and increases their demand.

Dietzel also fails to appreciate the redistributive effect of expenditures intended primarily for the benefit of the lower income classes. Although he emphasizes the general increase in the productivity of the economy resulting from loan-financed public expenditures, and mentions educational and health outlays, his main emphasis is on expenditures for goods of "a higher order"[2] which benefit primarily the wealthier groups; to the extent that other groups are also benefited, they should contribute to the annual interest payment. Thus not only are taxes and loans still related to particular expenditures, but the taxation of the lower income groups is likely to curtail their consumption of privately produced goods in exchange for benefits in which they are not primarily interested. For the higher income groups, on the other hand, it would merely involve a reduction in their disposable capital.

Dietzel furthermore explicitly excludes monetary factors from his analysis. This omission also leads to a disregard of the role of the rate of interest in influencing the "voluntariness" of the transfer of capital to the public economy.

Despite these shortcomings, Dietzel's analysis marks an important step forward in the understanding of the nature and role of public credit. The basic difference between his approach and that of the British classical economists stems from his concept of the productivity of public expenditures. The remaining pages of this essay will deal with the implications of this productivity concept for modern fiscal theory.

III. THE PRODUCTIVITY OF PUBLIC EXPENDITURES

"Productive" and "Nonproductive" Expenditures

The justification for loan-financed public expenditures is frequently based on the distinction between productive and nonproductive expenditures. What is not recognized is that this distinction is an historical anachronism—a carryover from the classical attitude toward productivity and public expenditures.

The thought underlying this distinction is that the economy is benefited more by the accumulation of physical assets than by immaterial gains. As a corollary, borrowing for "productive" expenditures is less objectionable than borrowing for "nonproductive" expenditures.

A basic reason for this attitude is reluctance to accept the increasing scope of government activity which is the consequence of the creation of immaterial capital. Many still cling to the distinction between productive and nonproductive, in one form or another, as a check on government expenditures and on the government borrowing which facilitates them. Opposition to an increase of the public debt stems largely from the aversion to increased government activity.

This is not far from the classical view of public expenditures as unproductive. Not only did Smith's analysis tie the concept of productivity to the creation of a durable good "which lasts for some time at least after the labour is past"; it also limited it to the creation of capital by the private economy.[9] Expenditures by the public economy on the production of services did not contribute to the annual product; hence, the outlays were unproductive. These included the whole government establishment, the officers of justice, the army, and the navy. Although they were unproductive, these outlays nevertheless were considered "useful."

Smith makes an exception in the case of public works. He accepts the construction and maintenance of public works as one of the duties of government, and recognizes their favorable effect on the annual product of the land and labor of the country. But he favors their financing from tolls and particular charges rather than from general public revenue.[10] And the labor which goes into the construction of these works is nowhere termed productive.

In the modern literature, the concept of productive public expenditures has been considerably broadened, as more and more exceptions to the narrow classical interpretation are introduced to meet changing needs. However, the classical influence is still evident, and the criterion of physical assets still predominates. Although this criterion grows more sterile with every new qualification that is added, no alternative approach has been forthcoming.

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[9] Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Modern Library edition, pp. 314–315.

[10] *Ibid.*, p. 682.

Ursula Hicks, for instance, distinguishes between active public debt, passive debt, and deadweight debt.[11] The first is incurred as a consequence of investment in self-liquidating capital projects or expenditures designed to increase the productive power of the community and raise the efficiency of the population. Passive public debt is incurred for expenditures which yield utilities and enjoyments, but do not increase the efficiency and productivity of labor and capital. Finally, deadweight debt is the result of expenditures which neither increase the productive power of the community nor produce any future flow of utilities. The most important instance is the war debt. The implications of this distinction, which follows the classical argument of Smith and Mill, are clear; namely, that the incurring of active public debt is the most desirable purpose of public borrowing, while the deadweight debt is a burden upon the economy, and therefore should be avoided where possible.

Alvin H. Hansen, commenting on this distinction, criticizes Mrs. Hicks' disregard of the effects of debt-financed public expenditures on the income of the economy.[12] He distinguishes between utility-creating, efficiency-creating, and income-creating public expenditures. War expenditures, which are not efficiency- or utility-creating, may nevertheless be effective in expanding income and employment in the economy.[13]

[11] *The Finance of British Government, 1920–1936*, 1938.

[12] *Fiscal Policy and Business Cycles*, 1941, pp. 144 ff.

[13] In his recent book, Prof. Hansen takes Dietzel's position when he remarks that "undue emphasis is laid on *tangible* wealth; intangible factors that contribute no less to the productivity of the nation are underestimated . . . Tangible assets are indeed an essential basis for high productivity, but no more so than the skill, health, and efficiency of the nation's citizens." (Italics of the author.)

Seymour E. Harris, discussing the limits of a rising public debt, argues for the deduction from the total amount of the debt of the capital value of assets yielding net income, in order to get a clearer picture of the burden of the public debt.[14] Thus, in his analysis also, the question of the debt burden is related to some extent to the physical assets which are created with the borrowed funds.

The same thought underlies *Withers*' analysis of the public debt.[15] In his view self-liquidating public work debts are defensible because they create liquid assets, and debts incurred during a depression because they are income-creating. Withers, however, still attributes some special advantages to the fact that capital assets may stand behind the public debt. But he gives to this view a novel interpretation. Even if public debts are not supported by assets held directly by the government, he finds it to be of significance whether, as a consequence of debt financing, the assets held by private enterprise have increased. These, according to Withers, should also be set against the increase of the public debt.

Thus, what started out to be a formula for circumscribing the bounds of loan-financed public expenditures has become so flexible that it no longer serves any useful purpose; it can be bent to fit any situation. While practically all public expenditures were originally considered unproductive, we have now reached the point where the reverse is held to be true; for one reason or another all types of debt-financed public expenditures are credited with having a favorable effect upon the economy. In the same measure as the concept of "productivity" has been broadened, it has lost its value as a guide of policy. To the extent that such guide can be recognized, priority is still given to the creation of physical assets.

He thinks, however, that as a matter of practical policy, loan-financing of current services, however valuable for productivity, is politically not feasible; and that it is, therefore, fortunate that the needed volume of useful and productive investment (in the sense of creation of capital assets) is more than ample to provide loan expenditure outlets for the flow of savings seeking investment. A. H. Hansen, *Economic Policy and Full Employment,* Whittlesey House, McGraw-Hill Book Company, Inc., 1947, pp. 185–186. Reprinted by permission.

[14] "Postwar Public Debt," *Postwar Economic Problems,* 1943.

[15] W. Withers, *The Public Debt,* 1945.

The Concept of Productivity Reconsidered

Dietzel's analysis is helpful in reformulating the concept of productivity as applied to public expenditures. What he attempted to show was that all public expenditures have to be considered as interdependent, and the significant consideration is their effect on the economy as a whole rather than the character of the particular outlay. The public and private economies, furthermore, are closely integrated and supplementary to each other, and their contributions to production and economic progress cannot be judged independently of each other. Furthermore Dietzel tried to show that there is no absolute and general order of preference between various types of public expenditures, but that the particular conditions and needs prevailing at a given time must determine the choice of expenditures. This fact is significant, not only for longer-run economic developments, but also in the case of change from peace to war conditions.

This abandonment of the quest for an abstract, objective, universally applicable formula is basic to a sound appraisal of the meaning of productivity. Properly interpreted, productivity is a subjective concept which reflects the thinking and the institutions of a particular social and economic framework. The terms "productive" and "unproductive" are analogous to "right" and "wrong," or "good" and "bad," which are useful distinctions at any given time, but which cannot embrace different periods, different places, or different sets of values.

This does not imply that there can be no criteria for establishing priority as between alternative public expenditures at any particular time. It is obvious that a choice must be made, since resources are limited. Just where to strike the balance is a fundamental issue in good government. There is no simple or precise guide. But if we can free ourselves from the rigid mold in which our thinking has been cast by use of the terms productive and unproductive, a long step will have been taken in the right direction. In a democracy these issues must be decided through compromise and majority will. Expenditures which are wanted badly by some people may appear unnecessary or undesirable to others. The determining consideration must be the greatest benefit for the greatest number within the limited resources available—and not only their direct and immediate effects, but also their more indirect social and economic repercussions must be taken into account. It is obvious that an abstract "objective" formula worked out at another time and place could not meet these requirements.

As Dietzel has shown, the concept of peacetime productivity is not applicable to wartime expenditures. During a war the primary aim of public expenditures is to protect the country, and to contribute to the successful prosecution of the war. Extensive expenditures for warships, airplanes, and munitions, which would be unnecessary, wasteful, and "unproductive" in peacetime, are eminently productive in wartime because on them depends not only the survival of the country, but the protection of its wealth and the opportunity for further peaceful progress. In addition, they increase the output of the economy by furthering capital accumulation, promoting inventions and labor-saving techniques, and, as a longer-run effect, promoting international trade and opening up new territories to industrialization. Taking all these facts into consideration, Dietzel points out that it can fairly be questioned whether the amazing economic ascendancy of Great Britain in the nineteenth century would have occurred equally rapidly had she not made a forceful use of her public credit victoriously to conduct the numerous and expensive wars leading up to and including the Napoleonic Wars.

Likewise in peacetime, the construction of physical assets, such as highways, bridges, and public buildings, may be highly productive at one time, but undesirable and wasteful at another when expenditures for education, health, or recreation have a more urgent claim on the nation's resources. In a country ravaged by wars and poor in capital, the construction of the necessary public and private physical plant is an urgent task, and expenditures for that purpose are eminently productive. However, under different circumstances, expenditures for long-range development projects and for the improvement of the nation's health may be more urgent.

A logical extension of Dietzel's position is that in times of severe depression, when the creation of employment opportunities and a rise in national income are of major concern, expenditures to achieve this purpose are highly productive. Thus even leaf-raking or the construction of buildings which satisfy purely artistic desires would qualify as productive expenditures if they contribute toward this goal. On the other hand, they would be wasteful and unproductive if the same results could be achieved by outlays for works or services which would satisfy more urgent needs.

The decisive consideration must always be in terms of what is needed most in any given situation. The most "productive" pattern of expenditure is that which contributes most toward the achievement of the economic, political, and social aims of a particular time and a particular country.

This interpretation of "productive public expenditures" has an important bearing on the question of their financing. It means that the traditional criterion of productivity ceases to be the determining factor in deciding between taxes and loans. Instead of relating a particular type of expenditure to a particular method of financing, the impact on the economy of all expenditures and of all sources of revenue becomes the decisive consideration. To use Dietzel's terminology, both immaterial and material capital have an equal claim on loan financing. This approach also has the effect of subordinating the importance of self-liquidation. As Dietzel points out, the significant fact in public investments is the increase in productivity of the economy as a whole. This increase is the economic source of the interest payment on the loan. Self-liquidating outlays are no more productive than non-self-liquidating expenditures, and even where the imposition of a fee for service is found convenient, it should not be considered as equivalent to the individual benefit derived from the expenditure.

This does not mean that large capital outlays should not be financed more frequently from loans, or preference be given to taxation for regularly recurring outlays. The reason, however, cannot be that the former are more productive, but only that such a choice appears to be in the best interest of the economy after taking account of general economic conditions, the quality and structure of the tax system, the impact of the particular expenditure on the economy, and the inflationary and deflationary aspects of alternative methods of financing.

These same considerations, as Dietzel has pointed out, apply to the issue of debt repayment. Here again the decisive consideration is not the purpose or character of the particular expenditure but the relation between the capital of the individual economies and the public economy, and the effect of debt repayment on capital formation and the optimum use of resources.

In a sense these principles are almost too obvious for mention, since most of them have been enunciated in recent years by leading economists. However, the insistence that still prevails upon applying some kind of restrictive "productivity" test in issues connected with public expenditures and the public debt is evidence enough that these propositions can bear repetition. Much still remains to be done in presenting "the state credit and its application as a system, as a necessary occurrence of higher economic development, and the 'state debt' as an indication of the wealth of the nation." [16]

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[16] Dietzel, *op. cit.*, p. 20.

IV

Business-Income Taxation and Investment Incentives

BY

E. CARY BROWN

TAXES CAN affect investment expenditures in a number of ways. They reduce the disposable income of some income recipients, decrease their consumption expenditures, and, indirectly, may reduce the level of investment. Also, they may directly reduce investment expenditures through their effect on the profitability of investment or on the funds available for investment. The reactions set up finally may affect the rate of interest, which in turn will have an impact on the level of investment expenditures.

In this paper, only one phase of these broad problems will be considered, namely, the direct effect of a business-income tax on incentives to invest in durable producers' goods. Major emphasis is placed on the definition of the tax base—the question of depreciation policy receiving most attention with incidental attention given to the treatment of losses for tax purposes.[1]

As will be shown, modifications in the timing of depreciation can affect both the *amount* of taxes expected to be paid on income arising from an investment, and the *timing* of their payment. Both effects can alter the profitability of the investment. More liberal treatment of losses can affect the amount of taxes expected to be paid, but it has a relatively insignificant effect on the timing of these payments over the life of the asset.

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[1] Other treatments of the question of loss offsets have been made by E. D. Domar and R. A. Musgrave, "Proportional Income Taxation and Risk-Taking," *Quarterly Journal of Economics*, May, 1944, to which this paper owes a large debt; J. K. Butters and J. Lintner, *Effect of Federal Taxes on Growing Enterprises* (Boston, 1945), especially Chap. III; H. R. Bowen, "Taxation of Net Income from Businesses," *Bulletin of the National Tax Association*, December, 1945; and A. P. Lerner, "An Integrated Full Employment Policy," *International Postwar Problems*, Jan., 1946. For a discussion of depreciation, see Bowen, *op. cit.;* M. Kalecki, "Three Ways to Full Employment," and E. F. Schumacher, "Public Finance—Its Relation to Full Employment," in *The Economics of Full Employment*, Oxford University Institute of Statistics (Oxford, 1944).

To summarize the conclusions reached:

(1) The effect on investment incentives of a proportional tax levied only on business income can be neutralized (a) if the amount expended on durable producers' goods can be deducted from taxable income in the year when made, and (b) if the Government will pay for any "losses" of the firm at the same rate as it taxes the firm's income. Neither adjustment taken alone is sufficient for this purpose.

(2) Depreciation of assets over a short period, say, three to five years, would come reasonably close to neutralizing the adverse effect of the tax, provided the excess of depreciation over income in any year can be carried forward as an offset against future taxable income.

(3) If depreciation for tax purposes is spread over the economic life of an asset, the tax will adversely affect investment incentives, even though the Government reimburses business losses at the rate of tax.

(4) Under such a system of economic-life depreciation, incentives to invest are more adversely affected (a) the longer-lived the asset in which the investment is contemplated, (b) the higher the cost of investment funds to the individual firm, and (c) the greater the uncertainty of future income. These latter two effects are particularly severe on the new or small firm.

(5) Incentives to replace assets are less affected than incentives to make new investment. The existing firm would have its advantages furthered as against the new firm, replacement representing a larger proportion of investment outlays for the former than for the latter. For similar reasons the static firm is favored over the growing one.

(6) The effects as indicated in points (3) to (5) are greater, the higher the rate of tax.

I. BUSINESS-INCOME TAXATION UNDER CONDITIONS OF CERTAINTY

Taxation with Full Loss Offsets and Economic-Life Depreciation

First, let us consider the effect of the business-income tax on incentives to make new investment under conditions of certainty. For our purposes, new investment is distinguished from replacement only because the latter involves the discarding of an existing asset at the time the investment is made, whereas the former does not. Nothing is implied regarding the capacity or efficiency of the replacement.

1. *New Investment.* If an entrepreneur is maximizing total profits, he invests up to the point at which the cost of funds for investment equals the investment's yield (marginal efficiency of capital). To state this condition in another way, he is willing to make any investment outlays which are expected to bring in a greater amount of net receipts in present-worth terms.[2] By discounting to the present the algebraic sum of these changes in net receipts in each period, the present worth of the investment is determined. For a rate of discount, the entrepreneur uses the rate of interest he must pay on funds made available to him for the investment. We can think of him as ranking the various possible outlays on durable goods on the basis of the excess of the present worth of their future net receipts over their cost. He schedules all outlays for which this difference is positive, that is, in which the investment yield equals or exceeds the rate of interest.[3]

Assume now that a proportional tax is imposed on the excess of business revenues over expenses, interest expenses and dividend payments not being treated as deductions. Depreciation expense is determined by spreading the cost of durable goods over their economic life. If expenses exceed revenues in any year, the Government reimburses the entrepreneur for the loss at the rate of tax. That is to say, a \$100 profit will require the payment of \$50 tax, if the tax rate is 50 per cent; a \$100 loss will result in a \$50 refund from the Government. Thus, we have a truly proportional tax on income: each dollar of additional income will be taxed at the given rate; each dollar of additional expense will be reimbursed at the same rate. This type of system can be termed one of full loss offset, since losses will result in negative taxes whether or not past, present, or future taxable income is earned.

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[2] Scrap value at the end of the asset's life should be included as a receipt. Increased salaries should be included as additional payments if the investment requires additional managerial effort.

[3] However, if the entrepreneur's funds are limited, he would make only the most profitable investment which his limited resources permitted.

Under our assumptions the tax does not reduce the rate of interest at which the entrepreneur can secure funds.[4] Because the tax will reduce the prospective net receipts from investment, and because the discount factor applied to these net receipts remains unchanged, the present worth of some investment outlays will fall below their cost and they will become unprofitable.

In order to look more closely at these effects, the tax base will be separated into two parts: first, the net receipts expected from the investment before deducting depreciation; second, the deductions in the form of depreciation charges. The tax liability (or refund) for any given year is, of course, determined by applying the rate of tax to the algebraic sum of these two amounts.

The next step, after separating tax liabilities into these two components, is to treat the present worth of the tax rebates (negative taxes) resulting from the depreciation deduction as an offset to the cost of the asset in which the investment is contemplated.[5]

[4] Interest and dividend payments are not deductible in determining taxable income under our hypothetical tax. Thus the interest costs of the entrepreneur are not partially reimbursed by the Government through reduction in taxable income. Moreover, the rate of interest at which money is offered to the firm does not decrease, inasmuch as the investor can put his funds out in other ways, e.g., in Government bonds, free of the tax on business income. In the long run, of course, the interest rate may be affected.

[5] Even casual students of business reactions to the wartime excess-profits tax will recognize that this is not an artificial construction. With an 85 per cent tax rate there was much talk of fifteen-cent dollars.

Thus we compare the cost of the asset minus the present worth of the tax reduction from depreciation with the present worth of expected net receipts minus tax (the tax applied directly to net receipts before deducting depreciation). This method permits us to concentrate on the present worth of the tax rebates from depreciation. Since the present worth of prospective net receipts (before depreciation) will be proportionately reduced by the tax, some investments will become unprofitable unless the present worth of the tax rebates from depreciation reduces the cost of the asset proportionately to the rate of tax. This statement is equivalent to saying that the cost of the asset would otherwise exceed the present worth of the net receipts after taxes.[6]

To illustrate this point, assume that net receipts of $100 per year for 5 years are anticipated through acquisition of an asset costing $400. At a rate of interest of 8 per cent, the present worth of $100 per year for 5 years would be $400. The investment would be marginal, since its cost would just equal the present worth of the anticipated net receipts from its operation. Assume now the imposition of a 50 per cent tax on business income. With a depreciation rate of 20 per cent per year, taxable income would amount to $20, and taxes to $10. The present worth of the net receipts after taxes now becomes $360. The asset's cost of $400 would now exceed the present worth of the net receipts after tax by $40 (the present worth of the tax liabilities of $10 per year). On the other hand, we can consider the present worth of the net receipts as being reduced proportionately by the tax—from $400 to $200—and the cost of the asset as being reduced by the present worth ($160) of the tax rebates (of $40 per year) from depreciation. The cost of the asset is thus reduced from $400 to $240, and the discrepancy of $40 between cost and present worth of net receipts shows up again.

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[6] Before the tax $C = RA$ for the marginal investment, where C represents the cost of the asset, R the prospective annual net receipts per year for n years, and A the present worth of a dollar a year for n years discounted at i.

After the tax is imposed, this expression becomes $C = RA - t(R - \frac{C}{d})A$, where t is the rate of tax and d the number of years over which the asset can be depreciated for tax purposes. This expression can also be transformed to $C(1 - \frac{At}{d}) = RA\ (1 - t)$. If $\frac{At}{d} = t$, that is, if the tax reduces net receipts and the asset's cost proportionately, the pretax equality between C and RA will be re-established.

It becomes clear why the tax reduces investment incentives. *It stems from the failure of the present worth of the tax rebates from depreciation to reduce the cost of the asset by an amount proportionate to the rate of tax.* The aggregate amount of depreciation deductible over an asset's life is, by definition, equal to the cost of the asset. The aggregate tax reduction resulting from the deduction will thus be proportionate to the rate of tax. But because depreciation is spread out over the life of the asset, the resulting tax reduction is similarly spread out into the future. Upon discounting to the present these future tax rebates, their present worth falls below the sum of their annual amounts. Therefore, because the tax proportionately reduces the net receipts (before depreciation), but does not proportionately reduce an asset's cost, the tax makes some of the outlays unprofitable which were previously profitable. The level of investment under any given conditions of demand is reduced.

The smaller the present worth of the tax rebates resulting from depreciation, the greater is the harmful effect of the tax on investment incentives. Their present worth is smaller, the higher the rate of discount applicable. Thus, small or new firms with very limited access to cheap capital would find a future tax rebate of less worth to them than would a large firm with abundant cheap capital. The former's investment incentives would be reduced more than would the latter's.

Similarly, the longer the tax rebate is postponed on the average, the smaller is its present worth. Since depreciation is spread over a relatively long period for long-lived assets, tax rebates are subject to a larger discount, relative to the asset's cost, than are the rebates resulting from short-lived assets. This effect may change the ranking as to their profitability of various outlays on durable goods. Shorter-lived assets would move up the scale relative to the longer-lived.[7] All outlays would, however, become absolutely less profitable.

The strength of these factors is indicated in Table 3 which shows the present value of depreciation deductions as a per cent of the cost of an asset under different interest rates and different lengths of asset life. Reading from left to right indicates the decrease in the present worth of the depreciation deductions as the cost of borrowing increases; reading down indicates the decrease in present worth as the life of the asset lengthens. One can notice the marked reduction in present worth of depreciation deductions as longer-lived assets and higher interest rates are considered.

TABLE 3

Present Worth of Straight-Line Depreciation Deductions[a] as a Per Cent of Cost of Asset

ECONOMIC LIFE	ANNUAL DEDUCTION	PRESENT WORTH OF DEPRECIATION DISCOUNTED AT RATE OF INTEREST OF 2%	4% (annually compounded)	6% (annually compounded)	8%
(1)	(2)	(3)	(4)	(5)	(6)
5	20%	94.3%	89.0%	84.2%	79.9%
10	10	89.8	81.1	73.6	67.1
20	5	81.8	68.0	57.3	49.1
50	2	62.8	43.0	31.5	24.5

[a] Cost divided by length of life, assuming no scrap value.

The present worth of the depreciation deductions is not, of course, the factor which reduces the asset's cost in the preceding analysis, but the tax on this amount. For example, the table indicates that for a twenty-year asset and interest costs of 4 per cent (third line, Column 4) the present worth of straight-line depreciation would be 68 per cent of the asset's cost. If a 50 per cent tax were imposed, the net receipts from the asset would be cut in half, but the cost of the asset would be reduced only by 34 per cent (half of 68 per cent). Whereas before the tax, the cost was equal to the present worth of net receipts for the marginal investment, after the tax, the cost would exceed the present worth of net receipts by 16 per cent of the asset's cost: it would only have fallen to 66 per cent of its original cost after tax, whereas the net receipts after tax would have fallen to 50 per cent. With higher tax rates, these disproportions increase.

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[7] In a letter to the *Economist*, May 27, 1944, p. 719, a writer, obviously in business, points out that repairing an old machine may be favored under the income tax over acquiring a new asset. Repairs are deductible from taxable income in the year when made, but a new asset must be depreciated over its useful life.

2. *Replacement.* When no tax is in effect, the decision to replace an asset is similar to that when added investment is contemplated. A comparison is made between the cost of acquiring an asset with the present worth of the net receipts it is expected to bring in.[8] The remaining undepreciated cost of the asset to be discarded should not affect this comparison because the cost is sunk.[9] However, when the tax is imposed, the undepreciated cost of the old asset will affect the investment decision because it will affect tax liabilities. On the new asset, the entrepreneur may take a series of depreciation deductions. On the asset discarded, the undepreciated cost may be deducted in the year of replacement rather than depreciated over its remaining useful life. If the cost of the discarded asset has not been fully depreciated, a gain results from trading a series of future tax rebates for a present tax rebate of equal aggregate amount.

The larger the remaining undepreciated cost of the asset to be discarded (the newer it is or the higher its original cost), the greater is the present worth of the tax rebate associated with it. If the remaining undepreciated cost is sufficiently high, the inducement to make a replacement can be as high or higher than it was before the tax was imposed. The present worth of the tax rebate from discarding the old asset plus the present worth of the tax rebates on the new asset can reduce the cost of this replacement in proportion to the tax. Such a favorable result cannot take place, however, if the asset to be replaced costs the same amount as the replacement, and depreciation rates are the same on both assets.

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[8] If it or the asset replaced has any scrap value, this would enter into net receipts.

[9] This cost apparently is not disregarded, however, in many investment decisions. Discussions of replacement policies indicate the presence of some irrationality here.

In Table 4 are indicated the magnitudes involved in telescoping depreciation on the old asset into the year of replacement, assuming an interest rate of 4 per cent, identity between the cost of the old asset and its replacement, and the same depreciation rates for both assets. Column 2 indicates the present worth of the depreciation deductions on the new asset and is taken from Column 4 of Table 3. Columns 3 to 6 show the additions to that amount which result from discarding the old asset, assuming that varying percentages of its original cost remain undepreciated. These columns are computed as the difference in present worth of deducting (e.g.) 40 per cent of the cost of the asset in the year of replacement, or depreciating it normally (e.g.) at 5 per cent a year for eight years if the asset had an original depreciable life of twenty years.

TABLE 4

Present Worth of Tax Deductions from Replacement
as a Per Cent of Cost of New Asset
at 4 Per Cent Interest

ECONOMIC LIFE OF OLD AND NEW ASSET	PRESENT WORTH OF DEPRECIATION ON NEW ASSET	PRESENT WORTH OF TAX DEDUCTION ON OLD ASSET WHOSE REMAINING UNDEPRECIATED COST AS A PER CENT OF COST OF NEW ASSET IS			
		20%	40%	60%	80%
(1)	(2)	(3)	(4)	(5)	(6)
5	89.0%	0.0%	0.7%	2.2%	4.3%
10	81.1	0.4	2.2	5.3	9.6
20	68.0	1.1	4.8	10.8	18.7
50	43.0	3.0	11.3	23.1	37.3

As will be noted from the table, the present worth of the additional tax rebate increases more than proportionately with increases in the undepreciated cost and length of life of the asset discarded. The effect of changes in the rate of interest is not indicated in the table, but it is clear that higher interest rates will increase this factor as they make present deductions more valuable than future deductions. For example, Column 5, line 3, of Table 4 indicates that the present worth of the deduction from discarding a twenty-year asset, 40 per cent depreciated, is 11 per cent of the cost of the asset at a 4 per cent rate of interest. At an 8 per cent rate, the percentage would increase to 18 per cent.

Thus another element of scrambling is introduced in the pretax ranking of investments as to their profitability. Outlays for the replacement of assets with undepreciated costs move up the scale relative to expansion of depreciable assets (investment without replacement) and to outlays for replacement when the cost of the discarded asset has been fully depreciated. It is important to notice that a large part of the asset expenditures of existing concerns represents replacement of one kind or another. They would thus hold an advantage over the new or rapidly expanding firm, because the profitability of a large part of their investment expenditure would be less affected by the tax.

Taxation with Full Loss Offsets and One-Year Depreciation

We now drop the requirement that the cost of the asset must be spread over its economic life in computing taxable income, and permit taxpayers to shorten the life use for tax purposes. As they telescope the depreciation deduction, the present worth of the tax rebates from the depreciation increases as the rebates are shifted closer to the present. In the limiting case, the asset could be written off in one year. In such an event, the tax rebate from depreciation would be proportional to the tax. Investment incentives would be restored to their pretax level, since the tax would proportionately reduce both the prospective net receipts from investment and its cost. By paying the entrepreneur the tax on the asset's cost, the Government would literally be a partner in the firm. It would make a capital contribution on new investment at the same rate at which it shared in the future net receipts of the enterprise. The contribution would be made at the same time the investment was undertaken. In contrast, the full-loss-offset system with economic-life depreciation would spread the Government's contribution out over the life of the investment, and would require the firm to carry a larger debt and interest cost until this contribution was finally received.

From the point of view of the entrepreneur such a tax would imply a substitution of Government funds for private funds in proportion to the tax, with a corresponding shift in interest payments from private lenders to the Government in the form of taxes. The tax would not increase investment incentives over what they would be if no tax were imposed. Any investment in excess of the amount that would be made if no tax were in effect would also prove to be unprofitable after these adjustments in the tax. It would still fail to earn an amount sufficient to pay for the cost of funds used to make the investment. The reduction in the relative amount the entrepreneur would have to invest would not change the investment's relative profitability.

The type of tax necessary to neutralize the effect of the tax on investment incentives is a graft of the Kalecki system of a credit for investment onto the Domar-Musgrave system of tax refunds whenever losses arise. Both types of adjustment are theoretically necessary, and they cannot be viewed as alternatives.[10] As we have seen, a system of full loss offsets will not restore investment incentives to their pretax level when a tax on business income alone is considered, because it will not change the timing of the tax payments. A credit for investment will also fail if there is insufficient taxable income in the current year to absorb the full amount of investment undertaken.

[10] Lerner tends to look on one-year depreciation as an alternative method of offsetting losses. He rightly points out its deficiencies in this respect, but fails to appreciate the fundamental difference in the effect of the two adjustments. *Op. cit.*, pp. 98, 105.

II. BUSINESS TAXATION UNDER CONDITIONS OF UNCERTAINTY

Let us change the assumptions so that the entrepreneur is no longer sure what actual series of net receipts will be forthcoming from the asset. Future changes in prices and costs, the level of output, technologic changes, and the like, can, in various combinations, result in a wide variety of possible series of net receipts from the use of an asset. Some of the series of net receipts will have a present worth less than the cost of the asset. If one of these series turns out to be the one realized, the entrepreneur would make a loss on the outlay.[11]

The entrepreneur must somehow convert this variety of series into a present worth in order to know whether or not the asset is worth buying. The method he uses has been treated in a number of ways by different writers, some of which lead to different conclusions regarding the effect of a tax on investment incentives. Without in any way attempting a catalogue, the different implications of some of the alternative interpretations are indicated.[12]

Assume first that the business tax allows no loss offsets, and requires economic-life depreciation. The present worth of the net receipts, however it is determined, will be reduced proportionately by the tax, before taking account of depreciation, as under conditions of certainty. The issues focus on the determination of the present worth of the tax rebates from depreciation. The question is whether or not their present worth falls below the tax times the cost of the asset because of the interest discount alone, as under conditions of certainty, or is further reduced because of uncertainty.

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[11] The maximum loss would equal the cost of the asset. A greater loss would imply a negative amount of future net receipts (operating costs exceeding operating revenues). Since the original investment would not commit the entrepreneur to future outlays which failed to return their cost, he could abandon the asset when this contingency arose and avoid it.

[12] Recent articles of interest, most of which also contain useful references, are the Domar-Musgrave article; G. L. S. Shackle, "Interest Rates and the Pace of Investment," *Economic Journal*, March, 1946; M. Moonitz, "The Risk of Obsolescence and the Importance of the Rate of Interest," *Journal of Political Economy*, August, 1943; and F. A. Lutz, "The Interest Rate and Investment in a Dynamic Economy," *American Economic Review*, December, 1945.

1. The results would be the same as under conditions of certainty, if the entrepreneur adjusts the various series of net receipts *before* taxes to a representative series expected with certainty over the same time period as the unadjusted series. This representative series of net receipts would be able to absorb each year's depreciation charge. Because this deduction could be expected with certainty, the tax rebates from depreciation would be discounted only by interest.

2. If, however, the entrepreneur separately appraises the probability of a full absorption of the depreciation against a wide diversity of net receipts from the asset itself, as well as income from other assets of the firm, the depreciation deduction may be reduced by a discount for uncertainty and for interest. If some of the possible series of net receipts fall short of the cost of the asset, and if sufficient future taxable income from all sources is not certain to be large enough to absorb the depreciation deduction, the entrepreneur would determine the chances of an effective depreciation deduction in each year and then discount the resulting adjusted tax rebate to the present. The further in the future the depreciation deduction, the less sure would he be of a tax rebate. The adjustment for uncertainty would be larger.

3. An adjustment for uncertainty of an effective future depreciation deduction would also be present if the conversion of the various series of net receipts into a representative series expected with certainty were made by drastically shortening their expected duration. The entrepreneur may be quite certain that a given amount of net receipts will continue for a given period, but after that he may not be sure. The depreciation deduction would fall against this very brief period of net receipts from the asset in question, and then have to be absorbed by future taxable income from all other assets. Although the tax rebates from depreciation may be certain during the arbitrary period, after that

time they depend on future income which may be uncertain. A discount for uncertainty would be applied to them.

Thus, the tendencies found under conditions of certainty would be magnified under the latter two adjustments for uncertainty. The difference between the worth of present and future deductions would increase. Lengthening of depreciation periods, or choosing longer-lived assets, would decrease the proportion of the asset likely to be effective in reducing taxes as well as increase interest costs. The tax would thus create a wider gap between long-lived and short-lived assets, between incentives to expand assets as against replacing them, and would fall most heavily on firms with uncertain prospects of future income.

Full loss offsets and one-year depreciation would cope with any of these effects. Full loss offsets would make sure that depreciation would result in a tax rebate, regardless of whether or not future income was present; it would eliminate any uncertainty regarding the tax rebate from depreciation.[13] One-year depreciation would then have the same effect as it has under conditions of certainty; it would eliminate the interest discount applicable to the tax rebates from depreciation and return investment incentives to their pretax level.

It is not believed, however, that one needs to go as far as this to eliminate most of the effect of the tax. One-year depreciation and a reasonably long carry-forward of losses would probably come very close to achieving neutrality. Studies made of investment decisions indicate the prevalence of adjusting for uncertainty by sharp reductions in the duration of the net receipts expected from the asset. The period is so short that entrepreneurs can be fairly certain of their guesses. If this is so, the total cost of the asset can be absorbed by prospective net receipts within this period. If the cost exceeded taxable income in the year of investment, some postponement of the Government's contribution would result. But the discount applied to the postponed tax reduction would be relatively unimportant over the very short periods within which entrepreneurs expect net receipts to continue.

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[13] H. W. Singer, in a letter to the *Economist*, May 13, 1944, p. 648, suggested removal of this uncertainty by reimbursing the taxpayer for depreciation in years of loss at the rate of tax.

III. CONCLUDING REMARKS

This analysis does not imply that one should necessarily advocate full loss offsets and a one-year write-off of outlays on depreciable assets as desirable modifications in the corporation-income tax—the present system of *ad rem* business taxation in the United States—without a consideration of other factors. Some of the more important can be indicated briefly below.

1. The business-income tax we have discussed did not permit the deduction of interest payments; the present corporation income tax does. If interest is deductible, it would not be legitimate to assume that the rate of discount used by the entrepreneur is unaffected by the tax, as we have done in our analysis. If interest payments are permitted to reduce taxable income, the net interest costs of the entrepreneur are proportionately reduced. The Government shares in these costs by foregoing taxes. Thus, while yields would be reduced by the tax, interest costs would be equivalently reduced. Investment incentives would remain unaffected. One-year depreciation for debt-financed investment would not be necessary for incentive reasons. If applied to debt-financed assets, it would raise investment incentives above their pretax level.

2. Full loss offsets carry with them substantial costs, both revenue and economic. They may place more resources at the disposal of inefficient firms than if no tax were imposed. The existing definition of taxable income is not sufficiently precise to weed out losses sustained by those attempting to maximize profits from losses sustained by those in "business" as a hobby or those who charge consumption expenses to the firm's account. Salary payments to business owners would offer a convenient way of drawing funds from the Government.

3. Shifting from the present method of computing deprecia-

tion to a system permitting a one-year write-off would result in no revenue loss, if expenditures on depreciable assets were equal to what is now termed normal depreciation, and if the cost of existing assets remaining to be depreciated could be eliminated as a tax deduction. Even in this latter event, revenue losses would arise if more were spent on depreciable assets than normal depreciation. Normal depreciation is a moving average of capital outlays for a long period of time, moving more slowly, both up and down, than the annual outlays themselves.

However, it seems idle to discuss a depreciation policy which implies the elimination of the cost of existing assets' remaining to be depreciated. If these assets are depreciated normally and future outlays written off in one year, the loss in the corporate tax base is huge. Contrary to popular belief, this substantial loss in tax base would never be recaptured so long as outlays on depreciable assets average no less than normal depreciation. Writing off the additions to depreciable assets would keep the depreciation deduction up to what it would have been if normal depreciation were taken on total assets. On top of this is added the write-off of existing facilities at a normal rate. In the first year this amount might be as great as asset expenditures; gradually it would diminish to zero when all existing assets had been discarded. At this point total depreciation would have returned approximately to what it would have been under normal depreciation because outlays on new assets, equal to normal depreciation, would continue to be written off. A permanent bulge in total depreciation charges thus arises.

Revenue losses are unimportant in themselves, but they do indicate the price tag connected with returning investment incentives to their pretax level. This form of revenue cut must be weighed, in its stimulus of private expenditures, against other varieties of tax reduction. In magnitude it is by no means inconsiderable.

This drawback can be substantially eliminated by a system which permits the firm to deduct either (1) current outlays (or an average of outlays for a short period) on depreciable assets or

(2) normal depreciation on total assets. The additional depreciation deduction is then limited to firms which are spending more than normal depreciation on their fixed assets—new and growing firms. Under such a system the tax burden can be shifted from the dynamic to the static elements in the business community.

V

Alternative Expansionist Fiscal Policies: A Diagrammatic Analysis

BY

ROBERT L. BISHOP

THERE HAS been growing recognition in the last few years that "deficit spending," i.e., raising expenditures without raising taxes, is by no means the only expansionist fiscal policy. A depressed national income may also be raised to a more satisfactory level by a balanced increase of both government expenditures and taxes; or it may be raised by simply reducing taxes and so inducing an expansion of private consumption. The one is a policy of "spending without deficit," while the other is a policy of "deficit without spending." Indeed, these are conveniently considered as the poles of fiscal policy; and if alternative fiscal policies are generalized in these terms, the traditional program of deficit spending will simply fall into place as one possible combination of these two polar policies.

In setting forth a diagrammatic analysis—and generalization—of these three standard types of expansionist fiscal policy, I shall emphasize the stable-equilibrium aspects of the determination of national income, before and after the alternative policies take effect. I shall also indicate the comparative magnitudes which these various policies involve—under certain simple and popular assumptions.

Some of these simplifying assumptions are quite "neutral" and plausible; but others are only very dubiously realistic and are chosen frankly for their simplicity and convenience. As a result, the relevance of the following analysis for the real world is subject to a good deal of qualification; but I hope that even an oversimplified model may be useful if it depicts, to a first approximation of reality, certain fundamental relationships with emphasis and clarity. Because of spatial limitations, I must leave the needed qualifications of the naked, mechanical argument to the reader; but I hope to present a more fully rounded discussion of the present subject at another time.

While I shall discuss here only *expansionist* fiscal policy, on the hypothesis that national income would otherwise be at depression levels, I hope it will be amply clear that my analysis can be applied readily to those opposite circumstances which call for restrictionist measures. Depression and inflation are essentially opposites, the one a consequence of too little effective demand, and the other a consequence of too much. Similarly, anti-inflationary fiscal policies are simply the reverse of those designed to combat depression. I shall be able to comment more specifically on these points at the end of Section I.

I. THE STARTING POINT: UNDEREMPLOYMENT EQUILIBRIUM

Figure VII depicts an original equilibrium of national income at a depressed level, *OU*. The nature of this equilibrium may be explained in terms of an aggregate supply of national income (or output) and an aggregate effective demand for national income. I shall first indicate briefly the nature of these two determinants of equilibrium income, and then set forth the assumptions on which they are diagrammed in Figure VII.

Aggregate Supply and Demand

National income is in equilibrium when aggregate spending on the national output is just sufficient to justify the continued production of that output. I define the effective demand for national income as a schedule of what the community as a whole is willing to spend on the national output at its various levels. The supply of national income, on the other hand, is the schedule of what producers must receive in the aggregate, at each level of national income, in order to justify the maintenance of their current output. Equilibrium thus implies an equality of the demand for national income and the supply of national income.

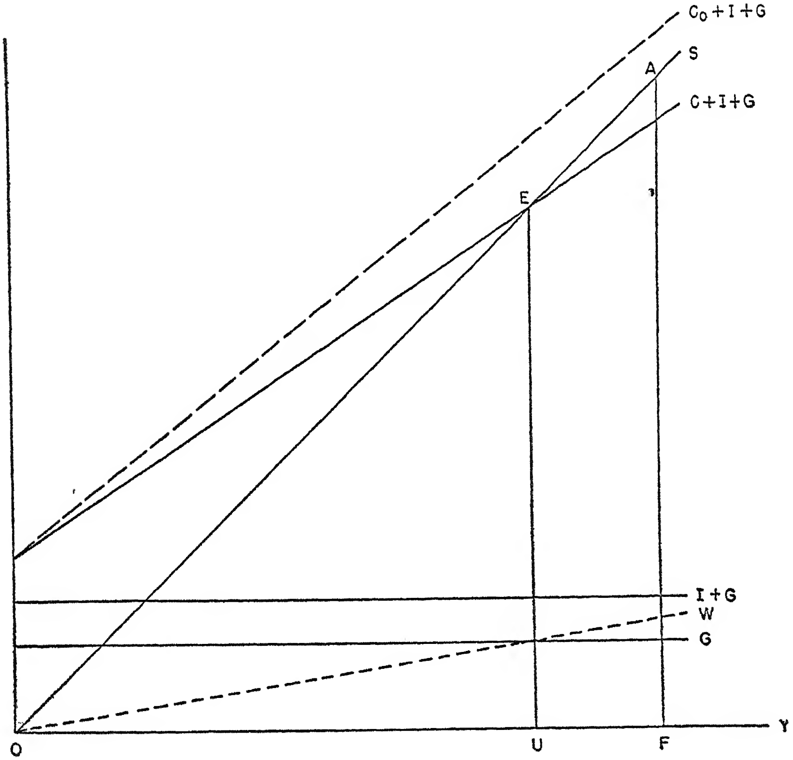

FIGURE VII

UNDEREMPLOYMENT EQUILIBRIUM INCOME

National income is denoted as *Y;* and I define it as the money value of net national product at market prices. In all the diagrams, it is measured on the horizontal axis, while the supply and demand schedules are plotted against the vertical.

National income "supplied" is identically equal to national income itself; so it is plotted as the 45° line OS. This implies that the producers' receipts necessary to justify any particular level of national income are equal in magnitude to the equilibrium value of the income produced. This latter concept, in turn, is based on the assumption that each level of national income implies its own "normal" magnitude of aggregate profits (or losses). The equilibrium receipts of producers are thus equal to their costs plus their normal profits, so defined.[1]

The demand for national income is here considered to be made up of three components: spending on private consumption (C); private spending on net real investment (I); and resource-using expenditure by the government (G)—which is to say, government expenditure on goods and services, as distinguished from transfer payments. Like national income itself, all of these components have the dimension of money value per unit of time; and each is to be considered, further, as an aggregated *propensity* to spend—as a schedule of what the community is *willing* to spend on net national product at its various possible levels. Each propensity to spend is, in general, some function of national income: $C(Y)$, $I(Y)$, and $G(Y)$. As additively plotted in Figure VII, however, these demand components reflect certain additional, specific assumptions.

I treat the component G not as a variable function of national income—as it may be more generally—but as a fixed amount, shiftable only in accordance with explicit political decision. Thus it is plotted in Figure VII as a horizontal line.

Private investment (I) is also assumed to be the same at different levels of income. Clearly, the investment component of national income is a very difficult one to handle satisfactorily in static-equilibrium analysis. Some theorists prefer to postulate it as an increasing function of income, or of private consumption; but the magnitude of investment is probably even more significantly dependent on the rate of change of national income, and the investment schedule is further subject to autonomous shifts of considerable importance. If only because of the difficulty of distinguishing these various forces determining investment, the simplest—and most frank—way of handling that component seems to be to treat it initially as a constant. Then, all actual changes of investment may be interpreted formally as shifts of a horizontal schedule. Abstracting from these difficulties, I shall plot the investment schedule as a horizontal, linear addition to Schedule *G*.

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[1] My exposition also implies that all output is produced explicitly for sale. Actually, of course, some output is produced for the producer's own use, in which case he is supplier and demander in one; but since it would be awkward always to have to take account of this relatively unimportant phenomenon, I shall continue to speak as though all demand takes the form of actual spending.

In the present analysis, it is necessary to work with consumption (*C*) as a function of national income; and I further assume, for simplicity, that this relationship is a linear one. The community's aggregate propensity to spend is thus diagrammed as $C + I + G$. This schedule, together with the 45° line *OS*, is sufficient to determine equilibrium national income; but I also include in Figure VII two other schedules which will figure significantly in my subsequent analysis of alternative fiscal policies.

The one labeled *W* represents taxes minus governmental transfer payments—the government's net "withdrawals" of purchasing power from private hands. National income less these governmental withdrawals $(Y - W)$ equals private disposable income plus net corporate savings.

With given tax rates and given transfer commitments, these net withdrawals (*W*) constitute an increasing function of national income. If plotted realistically, schedule *W* would be negative at very low levels of income, where transfer payments would exceed taxes; and it would almost certainly be concave, in reflection of the progressiveness of the personal income tax. Again for expositional convenience, however, *W* is assumed to be a linear schedule through the origin. Naturally, schedule *W* does not figure in the determination of equilibrium national income, except to the extent that it affects the spending schedules—notably the propensity to consume. *W* is interesting for its own sake, however, in that a comparison of *W* and *G* will reveal the condition of the government's budget at various levels of national income.[2] Quite arbitrarily, I have assumed the equality of *W* and *G* at the initial equilibrium income *OU*—implying a balanced budget at that income.[3]

Clearly, if the government changes its tax rates and transfer commitments so that there is a shift of schedule *W*, this will almost certainly bring about a shift in the consumption component of schedule $C + I + G$, because of the changed magnitude of income left in private hands at each level of national income.[4] So that this effect on consumption may be quite definite, I shall make the neutral assumption throughout my paper that the shifts of schedule *W* which occur do not affect appreciably the distribution of "income after taxes and transfer payments" at its various levels. More specifically, I assume that consumption as a function of national income will shift with changes of tax-and-transfer policy, but that consumption as a function of income-after-taxes-and-transfers $(Y - W)$ will remain unchanged.

It is useful to be able to compare visually these two consumption functions. For this purpose, I have included in Figure VII a second aggregate propensity to spend, $C_o + I + G$. This is the schedule which would prevail if taxes minus transfer payments (W) were zero at every level of national income. More generally, the component C_o also shows consumption as a function of income-after-taxes-and-transfers, with the horizontal axis of Figure VII considered as $Y - W$.[5]

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[2] The concept of the government's budget used throughout this discussion is the one that is most significant for purposes of income analysis; but it differs from our own government's kind of budget in several respects. I include on the expenditure side only spending on goods and services (*G*) and transfer payments of the kind which add to the recipient's disposable income. The items which the U.S. Government also includes, but which I exclude, are (a) appropriations which are not expenditures—such as those to the Social Security reserve—and (b) expenditures which do not add to the recipient's income—as, for example, in governmental purchases of land or pre-existing capital goods. Similarly, I exclude from the receipts side of the ledger the government's proceeds from the sale of existing capital assets.

[3] That is to say, the budget is balanced if taxes (*T*) equal government expenditure on goods and services (*G*) plus the government's transfer payments (*P*). Since $W = T - P$, the equation $W = G$ is the equivalent of $T = G + P$.

[4] A change of tax rates may also cause a shift of the investment schedule, of course; but since there seems to be no simple way of analyzing this type of effect quantitatively, I shall continue to neglect the whole question of changes in the level of investment. This is but one of the more important points on which my simplified analysis requires qualification.

The specific, algebraic relationship between the two consumption functions C_o and C is important in the consideration of alternative fiscal policies. The one which I treat as basic and unchanging shows consumption as a function (C_o) of income-after-taxes-and-transfers:

$$C = C_o(Y - W). \tag{1}$$

With given tax rates and transfer commitments,

$$W = W(Y). \tag{2}$$

Then, by inserting $W(Y)$ in equation (1), we find consumption as a function (C) of national income itself:

$$\begin{aligned} C &= C_o[Y - W(Y)] \\ C &= C(Y). \end{aligned} \tag{3}$$

This result may be described rather simply in words. Since consumption has been assumed to depend directly upon income (Y) and another variable (W), which in turn depends upon Y, it follows that consumption is uniquely related to Y. This relationship is shown in Equation 3.

In the light of my specific assumptions of linearity, these three equations become, respectively:

$$C = a_o + b_o(Y - W) \tag{4}$$

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[5] The geometrical relationship between C, C_o, and W is not complex. The ordinate of schedule C at any particular level of Y is the same as the ordinate of schedule C_o at the corresponding level of $Y - W$. In Figure VII, for example, the ordinate of schedule W at some particular level of Y, say OF, is equal to the horizontal distance from point B (on schedule $C + I + G$) to schedule $C_o + I + G$.

$$W = \alpha + \beta Y \tag{5}$$

$$C = a_o + b_o(Y - \alpha - \beta Y)$$

$$C = (a_o - b_o\alpha) + b_o\,(1 - \beta)Y. \tag{6}$$

Here, of course, α, β, a_o, and b_o are simply the parameters of linear equations. In particular, b_o is the marginal propensity to consume out of income-after-taxes-and-transfers, or the slope of schedule $C_o + I + G$. Similarly, β is the slope of schedule W.

Denoting $(a_o - b_o\alpha)$ as a, and $b_o(1 - \beta)$ as b, we now have consumption as the linear function of national income which is diagrammed as a part of schedule $C + I + G$:

$$C = a + bY. \tag{7}$$

The community's marginal propensity to consume, with respect to national income, is thus the constant b; and, if $0 < b_o < 1$ and $0 < \beta < 1$, then $0 < b < b_o$. This constant b is also the slope of schedule $C + I + G$.

Incidentally, the schedules of Figure VII have been drawn on the basis of specific, consistent numerical assumptions. In the following summary, integers refer to billions of dollars: $G = 20$; $I = 10$; $C_o = 10 + \frac{4}{5}Y$; $W = \frac{1}{6}Y$; and $C = 10 + \frac{2}{3}Y$. The latter three equations imply that $\alpha = 0$, $a_o = a = 10$, $\beta = \frac{1}{6}$, $b_o = \frac{4}{5}$, and $b = b_o(1 - \beta) = \frac{2}{3}$. These magnitudes are chosen, of course, primarily for their arithmetical convenience; but they may not be too wide of the mark for the American economy of some few years hence—in terms of the price level of, say, 1945.

Equilibrium Income

All the elements of Figure VII have now been explained. The supply of national income has been identified as the 45° line OS; and the aggregate demand for income has been similarly pictured by the summary schedule $C + I + G$. Equilibrium income is determined, then, where "demand equals supply"—where the total amount that the community is willing to spend on net national product is just sufficient to sustain that net product.[6]

Further, this equilibrium is a stable one because schedule $C + I + G$ has a slope of less than unity. At income levels below OU, the demand for income would exceed its supply; so income would rise toward equilibrium. And conversely, at higher incomes than OU, demand would be less than supply, thus causing income to decline toward equilibrium.

When income is out of equilibrium, a variety of patterns of readjustment are possible. The simplest presupposes that prices are not affected, but that producers are simply left with bigger or smaller inventories than they had anticipated. At income levels below OU, where the schedule of aggregate spending lies above OS, demand exceeds current output. Hence inventories would be unexpectedly reduced; and producers would respond by increasing production toward equilibrium. Naturally, the converse applies if income should exceed OU.

In equilibrium and out, it may be noticed, *realized* consumption, investment, and government spending add up, by definition, to national income. In the disequilibrium sequences just indicated, this identity is maintained because the unexpected inventory change which occurs in a disequilibrium situation represents unintended investment or disinvestment. But since actual investment differs from planned investment, national income is propelled in the direction of equilibrium. Thus, although national income is identically equal to the sum of the *realized* magnitudes of its components even in disequilibrium, *only* in equilibrium is national income equal to the aggregated *propensities* to spend. This distinc-

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[6] This equilibrium condition may be stated in a single equation:

$$Y = C(Y) + I(Y) + G(Y)$$

The left-hand side of this equation denotes supply, identically equal to national income itself, while the right-hand side is the expression for effective demand.

It is difficult to say who is the "inventor" of the type of diagram that is used here for the depiction of equilibrium income. The earliest published one of which I am aware appears in an article by Paul A. Samuelson, "A Synthesis of the Principle of Acceleration and the Multiplier," *Journal of Political Economy*, Vol. XLVII, No. 6 (December, 1939), pp. 786–97. Cf. also Alvin H. Hansen, *Fiscal Policy and Business Cycles* (New York, 1941), p. 229.

tion should cause no trouble, for it is closely analogous to the one encountered in traditional supply-and-demand analysis. Demand and supply are equal only in equilibrium; the amount bought and the amount sold are identical by definition.

Finally, by hypothesis, the equilibrium income OU implies an appreciable amount of unemployment; and this income is to be compared with the "full-employment" level of income OF.[7]

Consistent with the numerical parameters given at the end of the last section, $OU =$ one hundred twenty billion dollars and $OF =$ one hundred fifty billion dollars.

Just as this underemployment equilibrium is the consequence of too little effective demand, so is inflationary pressure the consequence of too great a propensity to spend. It is easy to see how this would be pictured in a diagram such as Figure VII. Schedule $C + I + G$ would then lie above OS at the full-employment income OF; there would be an "inflationary gap" to the extent that demand exceeds supply at that income level. Then, if the real income signified by OF cannot be exceeded, either prices would have to rise or the excess demand would have to be rationed. Anti-inflationary fiscal policy, naturally, would be concerned with shifting the aggregate spending schedule downward to a point of intersection with OS at the income level OF. Obviously, my ensuing discussion of expansionist fiscal policy will apply in reverse when such restrictionist measures are called for.

II. THREE EXPANSIONIST FISCAL POLICIES

If national income is in equilibrium at some such depressed level as OU in Figure VII, it will rise only by virtue of an upward shift of the aggregate schedule of effective demand, $C + I + G$. Formally, this result may be brought about by an increase in any one or more of the three demand components—provided that this favorable tendency is not fully offset by some downward schedule shift. These shifts, favorable and unfavorable, may occur spontaneously or as the result of positive governmental action. The present discussion is concerned with the possible results of only a limited variety of governmental policies, having to do with the magnitude of the government's expenditure on goods and services (G) and the magnitude of the net governmental withdrawals of purchasing power from the private sphere of the economy (W).

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[7] It is a commonplace that "full employment" is an ambiguous concept, if only because it does not mean zero unemployment. Naturally, one cannot stop to debate here how much unemployment it does mean, or how great an income can be attained without also inviting what would be considered to be too strong an upward pressure on prices. Subject to the recognition of these uncertainties, OF is visualized as the highest attainable income consistent with the community's desire for leisure—and compatible also with "reasonably" stable prices.

Three types of anti-depression fiscal policy will be considered: [8]

(1) An increase of government spending on goods and services, with no change of policy as to tax rates or transfer payments; [9]

(2) An increase of government spending, with tax rates increased so that the budget is balanced at the new equilibrium level of national income;

(3) A reduction of taxes, with government spending unchanged.

A separate diagram will be used for the analysis of each of these three fiscal policies. In each case, national income is assumed to be in equilibrium, originally, at the depressed level OU, from which it is to be raised to the level OF, signifying "full employment."

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[8] These correspond to Beveridge's "three routes" to full employment, and in the same numerical order as in his book. Cf. *Full Employment in a Free Society* (New York, 1945), pp. 142 ff.; also pp. 344–401, Nicholas Kaldor's Appendix C, "The Quantitative Aspects of the Full Employment Problem in Britain."

[9] Throughout the balance of my paper, the phrase "government spending" will refer only to outlays of this kind, on goods and services. The symbol G signifies this type of government expenditure.

Similarly, the word "taxes" will be used in the sense of "taxes minus transfer payments"; and this magnitude will still be identified, accordingly, by the symbol W. An "increase of taxes"—or an upward shift of the schedule W—may thus reflect a downward shift of the schedule of governmental transfer payments as well as an increase in the complex of tax rates. In a very real sense, transfer payments are simply "negative taxes"; and this usage implies that net "taxes" (W) may, on balance, be negative. Also, what I have hitherto called "income-after-taxes-and-transfers" ($Y - W$), I shall hereafter designate by the shorter phrase, "income-after-taxes."

In Figures VIII, IX, and X, the component demand schedules—C, I, and G—are precisely the same as in Figure VII. Hence the *original* aggregate schedule of effective demand, in every diagram, is also the same as $C + I + G$ in Figure VII, even though the order in which the separate components are added varies. Similarly, OU and OF imply the same magnitudes, respectively, in all four diagrams. Finally, the original schedule of taxes minus transfer payments (W) is also the same in all the diagrams, although in each instance it appears as an addition to some artificial base. This is always the same base to which government expenditures (G) happen also to be added. Consequently, G and W may be readily compared, to reveal the condition of the government's budget.[10] Of course, in the original equilibrium of national income at OU, the budget is balanced—in Figures VIII, IX, and X as well as in Figure VII.[11]

[10] In Figure X, the slope of the schedule $W + I$ is the same as the slope (β) of plain schedule W in Figure VII. In Figures VIII and IX, however, the slope of schedule $W + C + I$ is equal to $b + \beta$, the slope of the consumption function plus the slope of schedule W.

Since β is assumed to be greater than zero, the slope of schedule $W + C + I$ is greater than that of schedule $C + I$. On the other hand, its slope is less than that of the line OS, or unity, if the marginal propensity to consume out of income after taxes (b_o) is not as great as unity:

$$\begin{aligned} &b_o < 1 \\ &b_o(1 - \beta) < 1 - \beta \\ &b_o(1 - \beta) + \beta < 1 \\ &b + \beta < 1 \qquad \text{because } b = b_o(1 - \beta). \end{aligned}$$

[11] I was stimulated to write this paper as the result of a brief note on the same subject by Professor Hansen, where a quite similar diagrammatic analysis is employed. See Alvin H. Hansen, "Three Methods of Expansion Through Fiscal Policy," *American Economic Review*, Vol. XXXV, No. 3 (June, 1945), pp. 382–87.

My presentation differs from his in several respects. The stable-equilibrium aspects of the determination of national income, before and after the changes in fiscal policy, were not made explicit in Hansen's treatment. National income was portrayed there as the sum of "(1) private consumption expenditures; (2) tax-financed public expenditures; and (3) net savings of corporations and individuals." These components add up *identically* to national income. Hence they are not sufficient to reveal the equilibrium level of income, which depends on the effective "offsets" to item 3. These offsets—private investment and deficit-financed government expenditure—Hansen handled in a merely implicit way. In addition, while Hansen explained the *direction* in which his diagrammatic schedules were shifted by changed fiscal policy, he could not

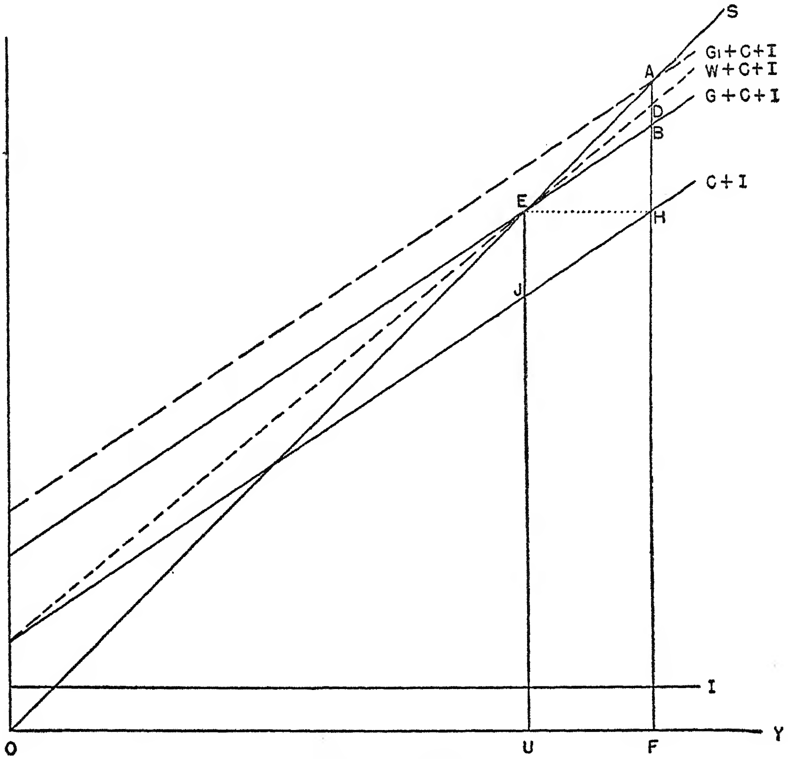

FIGURE VIII

"DEFICIT SPENDING"—GOVERNMENT EXPENDITURES INCREASED, TAX RATES UNCHANGED

Increase of Government Expenditures with Tax Rates Unchanged

This first case is shown in Figure VIII. National income is increased from *OU* to *OF* by an increase of government spending from the amount *G* to G_1. It is assumed that the consumption and

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include in his very brief discussion any analysis of the *magnitude* of those schedule shifts.

See also the algebraic analysis, with arithmetic illustrations, by Richard A. Musgrave, "Alternative Budget Policies for Full Employment," *American Economic Review*, Vol. XXXV, No. 3, (June, 1945), pp. 387-400, where qualitative differences between various types of taxes and expenditures are allowed for.

investment *schedules* are unaffected by this increase, so the new equilibrium income is determined by the intersection of the schedule $G_1 + C + I$ with the line OS.

The increase in government spending may be identified as BA; and this is proportionally related to the increase in national income, UF, by the multiplier: [12]

$$\overline{UF} = \frac{1}{1-b}\ \overline{BA} \tag{8}$$

The increase of government spending BA is less than the total increase of income which it induces, because consumption also increases—by the amount HB. This magnitude is related to UF by the marginal propensity to consume: [13]

$$\overline{HB} = b \cdot \overline{UF} \tag{9}$$

Since tax rates are not changed, the schedule of tax collections $(W + C + I)$ is relevant for the new equilibrium income. As a result of the increase of national income from OU to OF, taxes also increase—from $JE(= HB)$ to HD.[14] This leaves a government deficit of DA. The size of this deficit depends on the slope of schedule $W + C + I$, which is equal to the sum of b and β: [15]

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[12] This relationship is derived rather simply. Since b, the marginal propensity to consume with respect to national income, is the slope of schedule $G + C + I$,

$$\overline{HB} = b \cdot \overline{EH}$$

Then,

$$\begin{aligned}
\overline{UF} &= \overline{EH} = \overline{HA} = \overline{HB} + \overline{BA}\\
\overline{UF} - \overline{BA} &= \overline{HB} = b \cdot \overline{EH} = b \cdot \overline{UF}\\
\overline{UF} - b \cdot \overline{UF} &= \overline{BA} = (1-b)\ \overline{UF}\\
\overline{UF} &= \frac{1}{1-b}\ \overline{BA}
\end{aligned}$$

In Figure VIII, where $UF = 30$ billions and $b = 2/3$, $BA = 10$ billions.

[13] As indicated in the immediately preceding footnote.

[14] Notice that it is only as a coincidence that HB should indicate both the original magnitude of government spending and the increment of consumption induced by the appropriate increase of government spending. The coincidence is that schedule $C + I$ happens to intersect FA at an ordinate equal to UE.

[15]

$$\begin{aligned}
\overline{DA} &= \overline{BA} - \overline{BD}\\
\overline{BA} &= (1-b)\ \overline{UF} \qquad \text{(cf. Equation 8)}\\
\overline{BD} &= \beta \cdot \overline{UF}\\
\overline{DA} &= (1-b)\ \overline{UF} - \beta \cdot \overline{UF}\\
\overline{DA} &= (1 - b - \beta)\overline{UF}.
\end{aligned}$$

$$\overline{DA} = (1 - b - \beta)\overline{UF} \tag{10}$$

Alternatively, because $b = b_o(1 - \beta)$, the government's deficit may be expressed as a function of β and b_o, the marginal propensity to consume out of income-after-taxes:

$$\overline{DA} = (1 - b_o)\ (1 - \beta)\overline{UF} \tag{11}$$

Notice that the deficit DA must be positive, because b_o and β are each assumed to be less than one—as it is certainly plausible to assume. This also means, of course, that the slope of schedule $W + C + I$ must be less than that of the 45° line OS. Under these conditions, accordingly, it is not possible for extra government expenditure to "pay for itself" in the sense of inducing an *equal* increase of taxes, with *given* tax rates.[16]

Balanced Increase of Government Expenditures and Taxes

This second case is shown in Figure IX. National income is again raised from OU to OF, but now by a combination of increased government spending with increased taxes, so that the government's budget will be balanced at the higher income level.[17] This case is more complicated than the first because there will now

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Solving this equation in terms of our numerical parameters, we find $DA =$ five billions. This deficit must be less than the increase in Government expenditure BA, because β—the government's "marginal propensity to collect taxes"—is greater than zero.

[16] On the other hand, the stability of equilibrium does not require that b_o have a value less than one, but only that b, equal to $b_o(1 - \beta)$, be less than one. Hence it is conceivable for b_o to equal or exceed unity, with income in stable equilibrium only because β is sufficiently large. If b_o should be greater than one, an increase of government expenditure would actually create a surplus!

[17] The major references on the analysis of this policy are: Hansen and Perloff, *State and Local Finance in the National Economy,* (New York, 1944), pp. 244–246; Henry C. Wallich, "Income-Generating Effects of a Balanced Budget," *Quarterly Journal of Economics,* Vol. LIX, No. 1 (November, 1944), pp. 78–91; and Trygve Haavelmo, "Multiplier Effects of a Balanced Budget," *Econometrica,* Vol. XIII, No. 4 (October, 1945), pp. 311–318. See also Haavelmo's citation of still other references, and the subsequent discussion by Haberler, Goodwin, Hagen, and Haavelmo, in *Econometrica,* Vol. XIV, No. 2 (April, 1946). See also R. A. Musgrave, *op. cit.,* p. 400, and Board of Governors of the Federal Reserve System, *Financing Full Employment,* p. 12, where the view is taken that this third approach is of no practical significance.

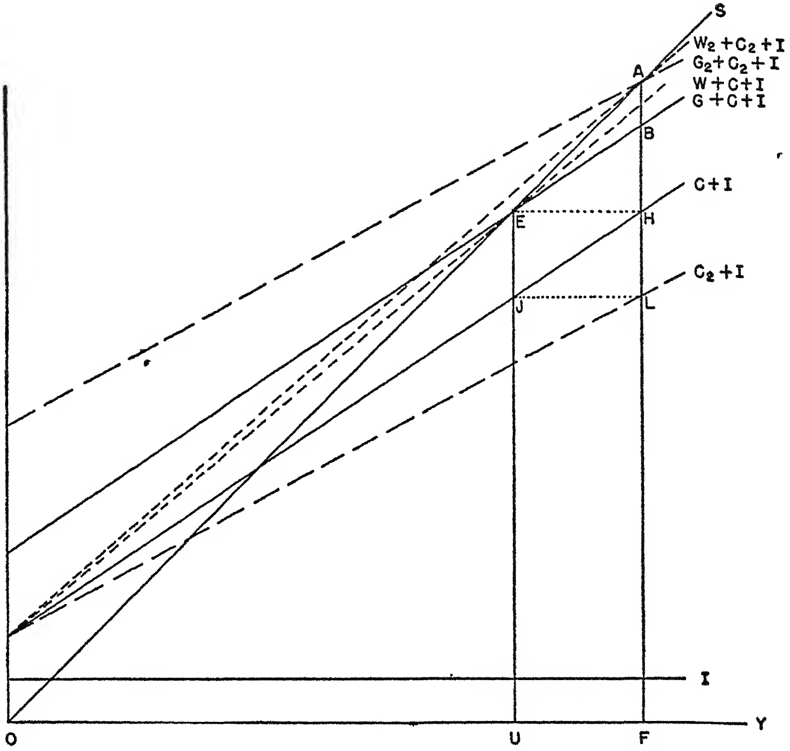

FIGURE IX

"SPENDING WITHOUT DEFICIT"—GOVERNMENT EXPENDITURES AND TAXES BOTH INCREASED TO MAINTAIN A BALANCED BUDGET

occur not only an increase of government spending, but also a downward shift of the consumption schedule, induced by the increase of tax rates.

The new tax function W_2 and the new consumption function C_2 are clearly related to each other, since they are both affected by the same new tax *rates*. As before, I assume that the change of tax rates leaves relative incomes unchanged, so that consumption as a function of income-after-taxes is also unchanged. This assumption, together with the restriction that investment (I) is both independent of national income and unaffected by the change in tax rates, leads to a peculiarly precise conclusion with respect to the effect on consumption of an equal increase of government spending and taxes. The amount consumed, under these conditions, is the same in the new equilibrium as in the old: in Figure IX, consumption C_2 at income OF is equal to consumption C at income OU. This also means that the tax-financed increase in government spending $(G_2 - G)$ is exactly equal to the increase in income UF which it induces.

The final constancy of consumption under the conditions just specified may be demonstrated; and since the theorem does not depend on the linearity of the schedules as diagrammed, the demonstration may be a general one. Notice that, in equilibrium,

$$Y = C + G + \bar{I}.$$

Now, by virtue of the equation $C = C_o(Y - W)$,[18] and in the light of the condition that the government's budget is balanced $(G = W)$,

$$Y = C_o(Y - W) + W + \bar{I},$$

or

$$(Y - W) = C_o(Y - W) + \bar{I}.$$

This is an equation in but the single compound variable, income-after-taxes $(Y - W)$. Because we can then solve this equation for $Y - W$, we know that the equilibrium magnitude of income-after-taxes is independent of the level of equilibrium national income (Y). Any change in tax-financed government expenditure $(G = W)$ is matched precisely by the resulting change in Y; so income-after-taxes—and hence consumption—are unaffected by such changes.

In Figure IX these results are shown. The schedule $C + I$ shifts downward to $C_2 + I$. Government spending increases from $G(=JE=HB)$ to $G_2(=LA)$, the net increase of this component being LH plus $BA(=UF)$. The total spending schedule is now $G_2 + C_2 + I$; and since this intersects OS at point A, the new equilibrium national income is indeed *OF*. The new tax schedule is constructed on the same base as G_2, and is accordingly labelled $W_2 + C_2 + I$.[19] Since schedule $W_2 + C_2 + I$ intersects

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[18] Cf. p. 323.

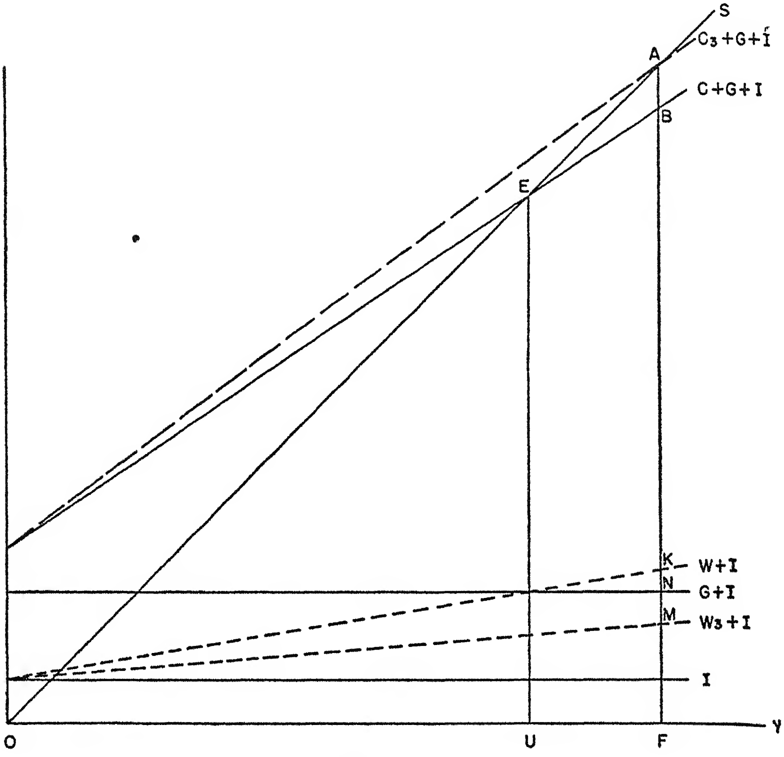

FIGURE X

"DEFICIT WITHOUT SPENDING"—TAX RATES REDUCED, GOVERNMENT SPENDING UNCHANGED schedule $G_2 + C_2 + I$ at point A, the government's budget is seen to be in balance at the new equilibrium income.

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[19] As to the slope of this schedule, it may be said that if the new tax function W_2 has the same slope (β) as the old (cf. Equation 5), the consumption schedule $C_2 + I$ will have the same slope as schedule $C + I$ (cf. Equation 6). Hence $W_2 + C_2 + I$ will also be parallel to $W + C + I$. If, on the other hand, the slope of W_2 is greater than β, the slope of schedule $C_2 + I$ will be less than $b_0\ (1 - \beta)$, which is the slope of $C + I$. But since any absolute decrease in $b_0(1 - \beta)$ is less than the absolute increase in β—because b_0 has a value less than one—the slope of $W_2 + C_2 + I$ will then be greater than the slope of $W + C + I$. It is so drawn, with $\beta_2 = 1/3$ as compared with $\beta = 1/6$. Then the slope of the new consumption schedule C_2 is $8/15$; and the slope of $W_2 + C_2 + I$ is $13/15$.

Reduction of Tax Rates with Government Spending Unchanged

This third case is shown in Figure X. National income is now to be raised to the level of OF solely by inducing an increase of private consumption through tax reduction. Here, it should be noticed, the tax schedules, old and new, are both measured from the investment schedule (I) as a base. As tax rates are reduced, the original schedule of total taxes, $W + I$, is replaced by some such lower schedule as $W_3 + I$. If this tax reduction is of the appropriate magnitude, it will cause aggregate effective demand to shift upward to the new position $C_3 + G + I$, intersecting OS at point A. As another consequence of the tax reduction, the government will now run a deficit, since public expenditures are assumed to remain at their original level.

Again it is assumed that the reduction of tax rates is of such a kind that the community's aggregate propensity to consume is an unchanged function of income-after-taxes. As before, this establishes a precise relationship between the shifts of the tax and consumption schedules.

Specifically, for every dollar by which taxes are reduced at any given level of income, consumption will be increased by a fraction of a dollar equal to the marginal propensity to consume out of income-after-taxes, b_0. Thus, where BA is the needed increase of consumption at income OF, and where MK is the appropriate tax reduction at that same income level,

$$\overline{BA} = b_0 \cdot \overline{MK}. \tag{12}$$

Alternatively, this relationship may be stated in terms of the slopes of the original consumption and tax schedules of Figure X, since $b = b_0(1 - \beta)$:

$$\overline{BA} = \frac{b}{1 - \beta}\ \overline{MK}. \tag{13}$$

Any new tax schedule passing through point M will suffice to raise consumption by the needed amount; but if the new tax schedule, like the old, is linear from the origin, the new schedule of aggregate spending will also be linear, as drawn in Figure X.[20]

When national income has reached its new equilibrium at *OF*, total taxes (W_s) are *PM*, while government spending (G) is still at its original level *PN*. This means that there is a deficit equal to *MN*. The size of this deficit is related to the induced increment of national income *UF* and the slopes b and β thus: [21]

$$\overline{MN} = \frac{1 - b - \beta}{b}\,\overline{UF} \tag{14}$$

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[20] The point *M* may also be found geometrically. Extend the schedules $C + G + I$ and $W + I$ to the right, into the range of incomes in excess of *OF*. Construct a horizontal line from point *A* intersecting schedule $C + G + I$ at some point *Q*. From this point drop a vertical line, intersecting schedule $W + I$ at point *T* and intersecting the income-axis at point *R*. The (physically unattainable) income *OR* is the one where consumption, with the original tax rates in force, would be equal to the consumption *NA* needed to justify the full-employment income *OF*.

We wish to duplicate at income *OF*, by virtue of lower tax rates, the same income-after-taxes that would prevail at income *OR* with the original tax rates. Accordingly, we measure downward from point *T* the distance *VT* equal to *FR*, the amount by which income *OR* exceeds income *OF*. From *V* we draw a horizontal line intersecting *FA* at point *M*.

Then, with total tax collections *PM* at income *OF*, income-after-taxes at this level of income will be the same as income-after-taxes at income *OR* with the original tax rates. Hence consumption will be equal in the two situations—and sufficient to justify *OF* as an equilibrium income. Incidentally, if consumption should be a non-linear function of income-after-taxes, this construction—unlike the simpler method in the text—would still serve to reveal the appropriate tax reduction.

[21] This result may be demonstrated:

$$\overline{MN} = \overline{MK} - \overline{NK}$$

$$\overline{MK} = \frac{1 - \beta}{b}\overline{BA} \qquad \text{(from Equation 13)}$$

$$= \frac{(1 - b)\ (1 - \beta)}{b}\ \overline{UF} \qquad \text{(from Equation 8)}$$

$$= \frac{1 - b - \beta + b\beta}{b}\ \overline{UF}$$

$$\overline{NK} = \beta \cdot \overline{UF} = \frac{b\beta}{b}\ \overline{UF}$$

$$\overline{MN} = \frac{1 - b - \beta}{b}\overline{UF}.$$

Or, since $b = b_0(1 - \beta)$, the deficit may be related to the induced increase of income simply in terms of the marginal propensity to consume out of income-after-taxes:

$$\overline{MN} = \frac{1 - b_0}{b_0} \, \overline{UF} \tag{15}$$

Notice that the government deficit may be either greater or less than the extra income—and consumption—which it generates. To the extent that b_0 is greater than one-half, the deficit *MN* is less than the increment of income *UF*. On the other hand, since b_0 is less than unity, the deficit must be positive.[22]

III. A SUMMARY AND GENERALIZATION OF THE THREE FISCAL POLICIES

The various relevant magnitudes implied by the three alternative fiscal policies—under the stipulated assumptions—may be tabulated, together with the results of any policy effected by a combination of the techniques of Cases 2 and 3. The column headings ΔY, ΔC, and ΔG refer, respectively, to the increments of national income, private consumption, and government spending which are implied by the various methods of raising national income from *OU* to *OF*. Likewise, the symbol ΔD refers to the increase of government deficit incurred—or this may be designated simply as *D* because the budget was assumed to be in balance at the original level of income *OU*.[23]

By way of illustration, I have included in the table—in brackets—the magnitudes which the three primary, alternative fiscal policies imply under the numerical assumptions used in the construction of Figure VII.[24] Naturally, the reader can make use of the algebraic content of the table to investigate the effects on these numerical values of different assumptions as to the slopes of the diagrammed schedules.

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[22] But if b_0 should equal one, there would be no deficit; and if b_0 should exceed one, there would be a budget surplus as a result of this policy of tax-rate reduction!

[23] Another column might have been added to the table, showing the change in taxes (ΔW) implied by each of the various fiscal policies. This magnitude may be found readily, since $\Delta W = \Delta G - \Delta D$.

[24] See above, p. 324.

Special notice should be drawn to the interesting relation between the deficits implied in Cases 1 and 3. The inducing of increased consumption through tax reduction (Case 3) results in a greater deficit than that created by an increase of government spending with tax rates unchanged (Case 1). The deficit in Case 3 times the marginal propensity to consume with respect to national income (b) equals the deficit in Case 1.

Since the fiscal policies of the second and third cases can be treated conveniently as the "pure" ones—the one increasing only government expenditure and the other increasing only private consumption—it is appropriate to consider the various possible combinations of these two policies that will also raise income from OU to OF. The implications of any such hybrid policy are indicated in the fourth row of the table. Here it is assumed that income is raised a fraction (p) of the needed amount (UF) by the technique of Case 3; and the rest of the needed increment of income is realized through the second policy. Then, of course, the higher is the value of p, the greater are private consumption and the government deficit, while government spending and taxes are correspondingly lower.[25]

Further, the hybrid policy is a general one—within the framework of the present assumptions. Case 3 implies p equal to one; Case 2 implies p equal to zero; and when p equals b, the result is the equivalent of Case 1. Nor need p be bounded by zero and one. It may be negative, implying a reduction in consumption, an increase in government spending correspondingly greater than UF,

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[25] The increment of taxes implied by this hybrid policy is:

$$\Delta W = \Delta G - \Delta D$$

$$\Delta W = (1 - p)UF - \frac{p(1 - b_0)}{b_0}UF$$

$$\Delta W = \frac{b_0 - p}{b_0}UF$$

Thus, ΔW is negatively correlated with p; and when $p = b_0$, taxes are the same before and after the raising of equilibrium income from OU to OF.

TABLE 5

	ΔY	ΔC	ΔG	ΔD (or D)	$\Delta Y/\Delta C$	$\Delta Y/\Delta G$	$\Delta Y/\Delta D$
Case 1 (Fig. VIII) "Deficit Spending"	UF [30]	$HB=$ $b \cdot UF$ [20]	$BA=$ $(1-b)UF$ [10]	$DA=$ $(1-b-\beta)UF=$ $(1-b_0)(1-\beta)UF$ [5]	$\frac{1}{b}$ [3/2]	$\frac{1}{1-b}$ [3]	$\frac{1}{1-b-\beta}=$ $\frac{1}{(1-b_0)(1-\beta)}$ [6]
Case 2 (Fig. IX) "Spending Without Deficit"	UF [30]	0	UF [30]	0	∞	1	∞
Case 3 (Fig. X) "Deficit Without Spending"	UF [30]	UF [30]	0	$MN=$ $\frac{1-b-\beta}{b}UF=$ $\frac{1-b_0}{b_0}UF$ [7.5]	1	∞	$\frac{b}{1-b-\beta}=$ $\frac{b_0}{1-b_0}$ [4]
Hybrid of Cases 2 & 3	UF	$p \cdot UF$	$(1-p)UF$	$\frac{p(1-b-\beta)}{b}UF=$ $\frac{p(1-b_0)}{b_0}UF$	$\frac{1}{p}$	$\frac{1}{1-p}$	$\frac{b}{p(1-b-\beta)}=$ $\frac{b_0}{p(1-b_0)}$

and a budgetary surplus; or it may exceed one, implying a decrease in government spending, an increase in consumption correspondingly greater than UF, and a government deficit greater than MN.

It is important to realize that government spending and a government deficit, so far from being necessarily conjoined, are really alternatives. On one side of the traditional policy of "deficit spending" is the spending-without-deficit of Case 2; on the other side is the deficit-without-spending of Case 3; and the infinite variety of intermediate policies are similarly characterized by an inverse correlation between the magnitudes of the government's spending and its deficit. The substitutability of the one for the other may be seen in the following equations—which are derived rather simply from a consideration, in the above table, of $\Delta Y/\Delta G$ in Case 2 and $\Delta Y/\Delta D$ in Case 3:

$$(16) \qquad \Delta Y = \Delta G + \frac{b}{1 - b - \beta}\,\Delta D = \Delta G + \frac{b_o}{1 - b_o}\,\Delta D$$

Thus, on the basis of my present assumptions, national income may be increased by a specified amount ΔY by any combination of increased government spending and increased deficit that satisfies these equations; and the equations also reveal the rate at which government spending may be substituted for a deficit without changing the total expansionary impact on national income. For example, where $b_o = 4/5$ (as in Figure VII),

$$\Delta Y = \Delta G + 4\Delta D.$$

Then, an extra dollar of deficit would allow a four-dollar reduction in tax-financed government spending without affecting the magnitude of national income; and this implies a total tax reduction of five dollars. Here it is assumed that the marginal propensity to consume out of income-after-taxes is four-fifths; but this marginal propensity need only be greater than one-half to justify the substitution of an extra dollar of deficit for more than a dollar of tax-financed government spending.

VI

Productivity and the Wage Structure[1]

BY

JOHN T. DUNLOP

THE *levels* of prices and wage rates could vary over time under the impetus of increasing productivity in accordance with at least three logically possible patterns: (1) constant prices and rising wages, (2) falling prices and constant wages, and (3) rising prices with wages rising at an even faster pace. The actual movements of wage and price levels would appear more closely to approximate case (1) than either of the other two cases.[2] The benefits of higher productivity have been shared since the early nineteenth century primarily by a combination of lower prices (for the innovations) and higher wage and salary rates.[3]

There is wide support for the view, moreover, that the general level of wage rates *should* as a matter of public policy rise in accordance with gains in productivity with a relatively constant price level. Professor Hansen concludes that ". . . there are good grounds for believing that the *long-run* movement of wages and prices broadly experienced in the nineteenth century represents the most desirable pattern."[4] The report of the Delegation on Economic Depressions admonishes trade union leaders that they should ". . . adopt a national wage policy under which demands for wage increases will be directly related to increases in productivity . . ."[5] The British White Paper on employment policy states that stability requires that ". . . increases in the general level of wage rates must be related to increased productivity due to increased efficiency and effort."[6]

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[1] Acknowledgment is made to the Milton Fund, Harvard University, for research assistance. The present topic is a part of a larger study of wages and prices.

[2] Alvin H. Hansen, *Fiscal Policy and Business Cycles*, 1941, pp. 323–324, and *Economic Policy and Full Employment*, 1947, pp. 240–245. See, on the other hand, a letter by Edward H. Chamberlin and Hans Staehle to the Editors of the *New York Times*, February 3, 1946.

[3] The gains of productivity have also taken the form of "new" products or changes in quality, serviceability, durability, and performance. The problem of the participation of profits in the gains of technical change is discussed briefly in note 10.

The relative movements of wage and price levels in the next generation have been dramatized as a contest between the power of labor organizations to push up wage and salary rates on the one hand and the ability of scientists, engineers, and business enterprises to reduce costs and keep prices down on the other.[7] The unions may not be content in the future with a wage level which advances no faster than 2 per cent each year, roughly the past average increase in productivity. They may require and be able to secure wage increases of 3 or 5 or 10 per cent each year.[8] If the business community reduces costs and introduces new commodities fast enough, prices and wages can move as they have in the past, case (1). If union pressure on wage rates is greater, a new relationship will be established, case (3).

While these issues of wage and price *levels* are fundamental, the impact of changes in productivity on the *structure* of wage rates and prices has too frequently been overlooked. Wage rates cannot be adjusted uniquely to increases in productivity in each occupation and plant and preserve for very long a balanced wage structure.[9] The rates of increase in productivity are markedly

[4] *Economic Policy and Full Employment*, Whittlesey House, McGraw-Hill Book Company, Inc., 1947, p. 243. Reprinted by permission.

[5] *Economic Stability in the Postwar World*, Report of the Delegation on Economic Depressions, League of Nations, 1945, p. 210.

[6] *Employment Policy*, Cmd. 6527, pp. 18–19.

[7] Sumner H. Slichter, *The Threat of Inflation*, an address before the U.S. Chamber of Commerce, April 30, 1946.

[8] Sumner H. Slichter, *The Challenge of Industrial Relations*, 1947, pp. 71–98.

[9] A balanced wage structure exists where workers performing similar services receive similar rates of pay. Variations in wage rates are related to differences in skill, experience, training, and other similar factors. The term will be used only in connection with the wage structure of a firm.

divergent among different firms and industries. Normal or practicable wage rate relationships would soon be distorted if wage rates were to be geared absolutely to increases in productivity. While the general level of wages may be adjusted to the average increase in productivity, in particular occupations, firms, and industries, the total adjustment normally takes the form of a combination of a wage and salary rate increase, a price (including product) adjustment, and in the short run an increase in profits.[10]

The present paper is directed toward examining some of the implications and problems that arise when it is recognized that wage and salary rates cannot be adjusted fully to productivity [11] changes in every particular occupation, plant, firm, and industry. The study is an exercise in the relationship of wages and prices; its focus is the impact of changes in productivity on wage rate structure. The concern is the longer run—rather than the cyclical [12]—adaptation of wage rates to uneven rates of change in productivity among different industries.

I. THE INDIVIDUAL PLANT WAGE STRUCTURE

The problems of the total system have their analogue in the individual plant. The rate of increase in productivity is unequal as among departments and particular machines. The job classification wage structure of a particular plant, determined by job evaluation or by a bargained scale, would soon be completely distorted if the gains in productivity were to go entirely to workers on particular operations with the improved efficiency. In practice, the gains in productivity may be described as temporarily retained in a "common pool" out of which the enterprise is able to grant a general wage increase to all employees. This procedure is also necessitated by the fact that many gains in productivity, such as those arising from improved organization and flow of operations, cannot be immediately allocated to particular workers.

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[10] While the present paper is not primarily devoted to the total problem of the way in which productivity gains are shared, the share of profits requires brief attention. The long run trends of wages and salaries and prices (including quality factors) indicate that productivity gains have been shared in these forms. Profits were not included in the list of long run recipients since the rate of profits has apparently shown no long term trend.

Profits, in the sense of "excess profit" above interest and wages of management, are necessary in the short run to induce enterprises to make the innovations. Under a perfectly competitive system, these "excess profits" are eliminated in the long run as the gains of productivity are passed on in the form of wage increases and price declines (including quality changes). See, Joseph A. Schumpeter, *Business Cycles*, 1939, I, pp. 72–109.

[11] The term "productivity" is used in this paper in the narrow sense of physical input-output relationships. When a statistical measure is implied, output per manhour is intended. The distinction between physical and value productivity must be borne in mind. See, National Bureau of Economic Research, *Cost Behavior and Price Policy*, 1943, pp. 142–169.

[12] For a discussion of cyclical patterns of wage rate changes among industries see, John T. Dunlop, *Wage Determination under Trade Unions*, 1944, pp. 122–148.

Even under an incentive or piece rate system of wage payment most agreements provide for a modification of the rate in the event there has been a *substantial* change in job content.[13] Piece workers cannot normally be prevented from capturing certain small gains in productivity arising from minor changes in methods and machinery, since changes must normally be "substantial" in order to alter the piece rate. Piece rate earnings will consequently tend to show some upward drift relative to day-rated jobs. The war period produced a number of cases in which piece workers were able to capture very substantial increases arising from specific improvements in productivity. However, most of the larger gains in productivity are normally distributed more generally throughout the work force in a plant.

It is thus an established norm of collective bargaining within individual bargaining units that gains of productivity ought to be distributed in ways which will not indiscriminately distort the balanced relationships among rates. Unequal rates of technical change may, however, in time substantially alter job relationships. In the garment industry, for example, over a number of years, as the result of a series of minor technical changes, the position of the presser (paid by the piece) has been improved relatively to the cutter (paid by the hour) so that he now earns more per hour on the average. But such an adjustment has come about slowly and quite gradually.

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[13] As one example, the Carnegie-Illinois Steel Corporation's Contract with the United Steelworkers of America, March 13, 1945 in Section 4, F, 2, specifies the conditions under which new wage rates may be set for changed jobs:

"When changes are made in equipment, method of processing, material processed, or quality of production standards which would result in a substantial change in job duties or requirements; or where over a period of time an accumulation of minor changes of this type have occurred which, in total, have resulted in a substantial change in job duties or requirements, adjustments of hourly, incentive, piece-work and tonnage rates, may be required."

The extent of the bargaining unit will largely determine the group of job classifications among which differentials will be maintained or adjusted according to systematic principle with differential rates of increase in productivity. If the bargaining unit is plant wide, the whole structure of rates in the plant will be less subject to productivity distortions. If there should be several bargaining units, the plant structure of rates will be much more difficult for the company to systematize and to defend against unequal rates of technical change.

As bargaining units are extended to multi-plant companies and to a group of companies or an industry, the agreed-upon structure of differentials is less subject to the haphazard impact of differential increases in productivity. Since few, if any, bargaining units completely encompass more than one industry, industry differentials have not been the result of conscious, intended decisions.

Thus two factors, the method of wage payment and the extent of the bargaining unit, will substantially influence the impact of changes in productivity on the structure of job classification wage rates in the individual plant.

II. PRODUCTIVITY AND INTER-INDUSTRY WAGE CHANGES

Consider the general level of wage rates for the system as a whole to increase each period by the average amount of the increase in productivity in the system. The rates of increase in productivity vary widely among industries and firms. (a) At one extreme, it might be assumed that the wage rate adjustments in each firm and industry correspond to these different increases in productivity. Normal wage relationships would be completely distorted. (b) At the other extreme, it might be assumed that the wage structure was so inflexible that there could be no change in firm or industry differentials. Wage rates would rise in every firm by the same amount. Then in industries in which productivity increased less rapidly than the average, prices would rise, and in industries in which productivity increased more rapidly than the average, prices would fall.

In the first case (a), the effect of the different rates of increase (or decrease in a few cases) of productivity is absorbed entirely through diverse wage and salary rate changes. In the second case (b), the divergent productivity patterns result alone in price adjustments. The wage structure, however, is in fact neither so flexible as assumed in the first instance nor so inflexible as imagined in the second.

A more realistic model, case (c), depicts industries with *more* than average gains in productivity increasing wage and salary rates somewhat more than the average. In industries with *less* than average gains in productivity, wage rates would increase somewhat less than average.

The rates of increase in productivity in an industry are to be expected to be closely related to other characteristics of the industry. The growth in output and employment[14] of various industries is frequently said to chart a common pattern. A period of slow growth at the initial stages is followed by a rapid expansion; a tapering off develops which may be followed in some cases by actual contraction and even extinction of the industry. The most rapid increases in productivity are to be expected in those stages in the life history of an industry during which output is expanding rapidly. Increases in productivity do take place after output has begun to taper off, but the opportunities for innovations of all types would seem on *a priori* grounds less favorable when output had ceased to expand or was actually decreasing.

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[14] The patterns of movement will, of course, be different depending on the rates of change in productivity.

The model of the relation between wage rate changes and productivity increments, case (c) above, needs to be enlarged, then, to take account of this kinship between changes in productivity and output. The greater than average rise in wage and salary rates in industries with high rates of increase in productivity arises not merely because firms may be able to pay higher wages or may be unable to prevent employees from taking some of the benefits. The greater than average rise in wage rates will be necessary to attract an expanding work force to the industry. The labor market typically operates so that a relatively higher wage rate is necessary to attract wage earners away from other employment than is required to hold them at a given job. Normal inertia must be overcome. Seniority rights are not lightly forfeited. A large proportion of all jobs are filled through contacts established by friends and relatives. These factors require that any firm or industry which seeks to expand its employment rapidly must expect to pay a premium rate.

Thus the greater than average rise of wage rates in employment and productivity expanding industries tends to attract a labor force to such industries. Similarly, the less than average increase in wage rates in employment and productivity contracting industries tends to facilitate the movement of a labor force away from such industries and to deter new entrants.

Moreover, the rise in prices in industries in which the increase in productivity is less than the average tends to accelerate the relative or absolute contraction of employment in such industries. The failure of prices to fall in industries with greater than average increases in productivity, as far as they might otherwise, tends to restrict the expansion of employment from what it would otherwise be. These relatively adverse effects on employment constitute the short-run effects of movement toward the longer run equilibrium position in which the average wage level is adjusted to an increase in average productivity.

Professor Hansen has suggested that the model, case (c), of the relationship between wage and salary rates, employment and productivity, is in fact a fair description of the actual world.[15] The next section turns to an examination of the available statistical data.

III. THE STATISTICAL EVIDENCE

There is considerable evidence that productivity has increased most in industries in which employment has expanded most, and there is some evidence that productivity has increased most rapidly during the "life-cycle" of an industry when employment was expanding most rapidly. Productivity conversely seems to have increased least in industries with the least increase, or actual declines, in employment, or in those stages in the life of an industry in which employment has been declining.

On the basis of data for thirty-eight manufacturing industries covering the period 1909–37 Solomon Fabricant reports that ". . . exceptionally rapid growth in output was associated with unusually drastic cuts in manhours per unit. Slow growth or actual decline in output was accompanied by less-than-average increase in total manhours and by relatively small declines in the manhour-output ratio." [16] Data for the same industries support the further conclusion that industries with the most rapid increase in employment and output and with the greatest rate of increase in productivity were also those with ". . . lowest increases (or actual decreases) in wage cost per unit, value added per unit, and selling price."[17] The converse holds for industries laggard in output, employment, and productivity.

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[15] "If industry Y can make no gains in productivity, it will nevertheless be compelled to pay higher wages. Being a relatively stagnant industry, it would scarcely be expected to raise wages as soon, or even as far, as the progressive industries. But wages must go up, or else a violent distortion will occur in the wage structure. Since industry Y has enjoyed no gains in manhour productivity, it must be permitted to charge higher prices.

"Thus the exceptionally progressive industries will be able to *lower* prices. But the stagnant industries will need to raise prices. Industries enjoying *average* gains in productivity can raise wages without raising prices. The net effect is an all-round increase in wage rates, while the general level of prices remains stable. But while the *general level* of prices remains stable, the *structure* of prices is changing in accordance with changing technological conditions varying from industry to industry." Alvin H. Hansen, "Wages and Prices: The Basic Issue," *New York Times Magazine*, January 6, 1946. Reprinted by permission.

[16] Solomon Fabricant, *Employment in Manufacturing, 1899–1939,* National Bureau of Economic Research, 1942, p. 92. Reprinted by permission. Also see, Solomon Fabricant, *Labor Savings in American Industry, 1899–1939,* Occasional Paper 23, National Bureau of Economic Research, 1945.

Thus the Fabricant study depicts an economy with a group of "younger" industries expanding rapidly in employment, output, and productivity with declining labor costs and prices. In a group of "older" industries employment and output increase very slowly or actually decline; productivity increases very slowly, and labor costs and prices increase absolutely, or at least relative to the first group of industries. The life history of the individual industry consists in a gradual movement from the first to the second group. At any one time industries are distributed throughout the range of the employment-output-productivity pattern.

Now, how are wage rate movements among industries related to the pattern of change in output, employment, and productivity? In particular, do wage rates increase most where and when productivity is increasing most rapidly, and do wage rates increase least in industries with least increases in productivity? The intermediate case (c) set forth above requires some positive correlation between increases in wage rates and productivity. Professor Hansen, it has been noted,[18] believes both that the economy should and really does work this way.

While the investigation of Solomon Fabricant was not primarily concerned with this range of questions, there is some disquieting evidence on the issue at hand. He reports that the coefficient of rank correlation ". . . between changes in unit labor requirements and in wages per worker is only —.05."[19] That is, for the period 1909–37 virtually no rank correlation was found in a group of thirty-eight industries between changes in productivity (wage earner hours per unit of product) and *wages per wage earner.*

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[17] Solomon Fabricant, *Employment in Manufacturing, op. cit.*, p. 100.

[18] See footnote 15.

[19] *Loc. cit.*, p. 105, n. 19. The computation has been made for the present study on the basis of data presented on pp. 102–104 and the slightly different result of +.04 was obtained.

Although Fabricant does not report the computation, his data permit a comparison of productivity (wage earner hours per unit of product) and *wages per hour.* The rank correlation has been computed to be +.22. The series of wages per hour is more appropriate for the instant purposes than wages per worker. Wages per worker are affected by varying rates of change in the length of the work day.

More reliable data for a shorter, though more recent, period show a much higher degree of rank correlation between productivity increases and wages. The Bureau of Labor Statistics data for thirty-three manufacturing industries or groups in the period 1923–40 yield a rank correlation of +.47 between increases in output per manhour and increases in average hourly earnings.[20] (These data are presented in Table 6.) When the series are weighted by the relative amounts of employment in the various industries, the rank correlation is raised to +.60.

The removal of two relatively insignificant industries from the series (ice cream and chewing tobacco) raises the computed rank correlation to +.65. When the series are weighted by employment in the various industries, the rank correlation is +.72. These data indicate a significant tendency, not necessarily unique, for wages to increase by a greater extent in industries with the higher increases in productivity and by a lesser extent in industries with lesser increases in productivity.

The relationship between wages and productivity proposed in case (c) in the previous section does not posit a unique pattern nor necessarily a very high correlation between wages and salary rates and productivity. The following factors act against a perfect correlation:

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[20] The basic data are from *Productivity and Unit Labor Costs in Selected Manufacturing Industries, 1919–1940,* Bureau of Labor Statistics, Washington, D.C., February, 1942. The output per manhour series is directly available, and the series of average hourly earnings for each industry was computed by dividing payrolls by manhours. The data are available to permit the addition of a series for Bituminous Coal and Steam Railroads. The rank correlation for the thirty-five series is +.49.

Average hourly earnings are the only data available to measure the changes in wage and salary rates for this period.

(1) The adjustment to productivity increases takes the form of price as well as wage changes. Thus one would expect a higher degree of correlation between changes in unit labor requirements and wages.[21]

(2) Wage relationships may have to be preserved among industries, regardless of the differences in the rates of increase of productivity. The wage relationship may follow from a common labor organization, the proximity of localities, or a common policy of a corporation operating in several industries. The cotton and wool industries, for example, are organized by some of the same labor organizations. Wage patterns may be related independently of productivity. Zinc and copper present the same situation. An "industry" is not necessarily a unique unit of wage rate determination.

(3) The method of wage payment may differ among industries and influence the extent to which increases in productivity are transformed into wage increases. Piece work or incentive rates permit a more regular and immediate capture of the gains of productivity than a day-rate wage payment system.

(4) The character of competition in the product market will influence the extent to which wage earners secure the gains of productivity. A highly competitive product market may immediately transmit any gains in productivity in the form of price adjustments rather than permit the employer to retain higher margins later to be shared with the wage earners in the form of higher wage rates. Partly for this reason, labor organization may prefer to deal with "monopolists" rather than with a "competitive industry." It is easier to capture the dynamic gains of productivity.

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[21] Fabricant reports a .39 rank correlation between changes in unit labor requirements and selling price in contrast to his —.05 rank correlation between changes in unit labor requirements and wages. *Loc. cit.* p. 108.

TABLE 6

Percentage Change in Output, Manhours, Output per Manhour, and Average Hourly Earnings, 1923–1940 *

INDUSTRY	CHANGE IN OUTPUT %	CHANGE IN MANHOURS %	CHANGE IN OUTPUT PER MANHOUR %	CHANGE IN AV. HOURLY EARNINGS %
All mfg. industries	52.5	—16.6	82.9	22.5
Agr. implements	54.4	—26.2	109.4	33.5
Boots and shoes	18.4	—28.9	66.7	—3.7
Bread & other bakery prod. group	29.8	15.4	12.4	19.6
Cane-sugar refining	—4.5	—38.4	54.9	32.6
Canning and preserving group	82.9	7.3	70.5	28.6
Cement	—4.5	—46.3	78.1	25.7
Chemicals	103.2	—0.5	104.3	64.1
Clay prod. and non-clay refractories	—42.1	—52.0	20.5	6.1
Cotton goods, New Eng. states	—49.2	—71.7	79.4	3.3
Cotton goods, cotton growing states	45.5	18.5	22.7	13.0
Fertilizers	17.2	—25.2	56.7	20.9
Flour and other grain mill prod.	—12.6	—41.9	50.7	15.8
Furniture	15.4	—18.9	42.4	3.1
Glass group	67.4	—22.0	114.5	42.7
Ice cream	36.1	—44.3	144.5	—1.4

* The figures in this table are based on Bureau of Labor Statistics indexes and indicate percentage changes for the years 1923–1940, with the exception of the following industries where the percentage changes are for the years 1923–1939:

Cotton Goods: New England States
Cotton Goods: Cotton Growing States
Knit Goods Group

TABLE 6 (*continued*)

Percentage Change in Output, Manhours, Output per Manhour, and Average Hourly Earnings, 1923–1940

INDUSTRY	CHANGE IN OUTPUT %	CHANGE IN MANHOURS %	CHANGE IN OUTPUT PER MANHOUR %	CHANGE IN AV. HOURLY EARNINGS %
Iron and steel group	41.2	—22.6	82.5	45.5
Knit goods group	72.2	—7.7	86.7	29.5
Leather group	—6.3	—41.7	61.3	25.8
Lumber and timber prod. group	—24.2	—49.1	49.0	10.7
Motor vehicles, bodies, and pts.	44.0	—16.5	72.5	36.5
Newspaper and periodical ptg. & pub.	36.5	—17.2	64.9	25.3
Primary smelters and refineries	23.4	—29.3	74.3	14.5
Paints and varnishes	57.5	2.8	53.3	37.2
Paper	68.8	5.9	59.4	22.2
Pulp	148.4	—8.4	171.3	35.8
Petroleum refining	128.7	—18.3	180.1	53.4
Rayon	1177.7	162.7	386.4	56.4
Rubber tires and inner tubes	105.0	—39.9	241.0	44.6
Slaughtering and meat pkg.	17.7	—14.3	37.3	26.8
Cigars	—27.0	—66.7	119.0	17.0
Cigarettes	183.9	19.3	138.0	40.0
Chewing and smoking tobacco and snuff	—16.5	—46.4	55.7	69.2
Woolen and worsted goods group	—22.3	—46.8	45.9	22.0
Bituminous coal	—18.4	—10.2	42.3	4.5
Steam railroads	....	—3.1	63.2	22.4

(5) The differences in bargaining power of labor organizations will influence the extent to which gains in productivity will be correlated with wage rate changes.

For at least these reasons, then, wage rate changes and increases in productivity are not uniquely related among different firms and industries. There is no reason, however, to abandon the general model indicated in case (c) above in which wage rates increase most in those industries in which employment, output, and productivity have increased most rapidly, and in which wage rates increase least in those industries in which employment, output, and productivity have increased least rapidly—if not actually declined. The model is a helpful and useful generalization and first approximation, particularly for total system problems, as long as the other factors influencing wage rate movements among industries are not entirely neglected. Professor Hansen's adoption of the model as a statement of fact is accurate as long as productivity is not set forth as a complete explanation of changes in inter-industry wage structure.

IV. WAGE LEADERSHIP

Any model of adjustments in the wage structure cannot neglect the facts of wage leadership in an economy with developing collective bargaining. If leadership in setting the pattern of wage adjustments is held by unions and firms in the expanding sector, where increases in productivity are high, the rounds of wage increases will no doubt be larger than in case the pace is set in contracting industries. Even among expanding industries it makes a good deal of difference whether the two or three most rapidly expanding industries set the pace or whether the pattern is more broadly based. It is conceivable that the wage bargain in one or two industries (rapidly expanding with the greatest increases in productivity) could force very substantial price increases on the rest of the whole economy.

It may be held that in normal times "wage leadership" does not exist. There is no very obvious pattern of wage changes. Contracts expire at different times, and adjustments depend upon essentially local or industry conditions. The amount of wage rate changes are substantially influenced by bargains over non-wage issues, such as union security, seniority, and management rights clauses in collective bargaining contracts. While this may be a fair description of the situation in the absence of powerful unions or in conditions in which significant union rivalry does not exist, it is not an accurate description of the industrial relations we have now or are likely to have in the years immediately ahead.

The location of wage leadership in the economic system depends on a great many different factors. With a united labor movement there would presumably be a possibility of a common wage policy on the part of organized labor. Intense inter- and intra-union rivalry, however, tends to make wage movements a pawn in the larger battle for prestige and position. Wage changes may be required sooner and in larger amounts by virtue of the strategy of these union "political" considerations. Wage demands are not formulated with primary regard to their economic effects. A wage adjustment is largely appraised in terms of how many new members may be attracted or whether it will contribute to "taking over" a rival organization.[22]

An organized employers' association which influences wage bargaining would permit a unified policy on the part of employers. In the absence of strong associations in most industries, wage rate patterns may be set by a maverick company which wishes to purchase some temporary advantage, or by an extraordinarily profitable enterprise which may not be particularly interested or concerned with the general impact of any change in wage rates. The business community is learning that one or two major companies can make a bargain which becomes very difficult for the rest to avoid.

Wage leadership may be located in particular industries by virtue of the "political" position of union leaders within the labor movement, by the accidents of mavericks and extraordinarily profitable firms, and by the chance of the timing of contract expirations. If this leadership happens to coincide with industries in which productivity has been increasing rapidly, the wage level may be expected to rise more than in other circumstances.

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[22] John T. Dunlop, *op. cit.*, pp. 46–50.

V. CHANGES IN INTER-INDUSTRY WAGE STRUCTURE

The model investigated above, case (c), seems to represent a useful general summary of the relations among inter-industry changes in productivity, employment, and wage and salary rates. But this generalization, even when qualified by the fact of wage leadership in collective bargaining, must not be taken as a final theory of the dynamics of changes in inter-industry wage relationships. This section is directed toward making some suggestions toward this larger and virtually unexplored problem of the pattern of longer run changes in the inter-industry wage structure.

That the generalization represented by case (c) is a useful starting point for a theory of the dynamics of inter-industry wage changes is evident from Table 7.[23] An array of the percentage changes in average hourly earnings during the period 1923–40 is presented for thirty-three manufacturing industries (with the addition of two other series, Bituminous Coal and Steam Railroads). The lowest fourteen industrial groups in percentage increase in average hourly earnings (Woolen and Worsted through Boots and Shoes) were almost without exception [24] industries with productivity and output increases below the average. The highest twelve industrial groups in percentage increase in average hourly earnings (Chewing Tobacco through Agricultural Implements) were with minor exceptions [25] industries with productivity and output increases above the average. The mere recital

[23] The data are the same as presented in Table 6.

[24] The series of Ice Cream and Cigars showed increases in output per man-hour above the average.

[25] Chewing Tobacco, at the top of the list, is an exception. In output and productivity the industry belongs with the relatively "stagnant" group. The industry has been omitted from later comparisons in the text.

of the industries with the greatest increase in average hourly earnings suggests those expanding in output and progressive in technology: Chemicals, Rayon, Petroleum Refining, Iron and Steel, Rubber Tires and Tubes, Glass, Cigarettes, Paints and Varnish, Motor Vehicles, Pulp, and Agricultural Implements.

A study of Table 7 underlines the severe limitations to the view [26] that inter-industry wage differentials are relatively constant over considerable periods of time. These thirty-five industrial groups reveal during a seventeen-year period a dispersion from a decrease of 3.7 per cent in the case of Boots and Shoes to an increase of 64.1 per cent in Chemicals.[27] This range of variation constitutes a surprising amount of pliability in the inter-industry wage structure.

The dispersion in Table 7 casts serious doubts on the position frequently taken in favor of a wage increase in negotiations or arbitration on the ground that traditional inter-industry differentials have been distorted. The longer the period of comparison, the more suspect the argument. The argument advanced against wage rate increases by managements on the ground that inter-industry differentials have been maintained, and consequently no increase is appropriate, is equally suspect.[28] Changes in the differentials in wages among industries of the magnitude indicated in Table 7 in a period of seventeen years makes such arguments highly questionable as a strong case for or against a particular wage rate increase. The simple fact is that the relative position of industries has been changing very rapidly over a period of time.

[26] Case (b) in Section II.

[27] Any complete study of movement of differentials should be made both in percentage and cents per hour terms. The cents per hour differentials in these instances would not reveal a significantly different picture. Moreover, the period 1923–40 saw an increase in the average hourly earnings for all manufacturing of only 22.5 per cent.

[28] See the Opinion of Board Members Felix H. Knight and E. E. Milliman, Employees' National Conference Committee, Fifteen Cooperating Railway Labor Organizations and Eastern, Western, and Southeastern Carriers' Conference Committees, National Mediation Board, Docket No. A-2215, Arb. 62, April 3, 1946. Also see the argument of the United Steelworkers of America, CIO, and the Steel Companies summarized in *Carnegie-Illinois Steel Corporation, et al*, 19 WLR 612–13.

Relative position cannot be a satisfactory norm for any significant length of time in an economy with such marked differences in the rate of change in employment and productivity.

TABLE 7
Percentage Increase in Average Hourly Earnings, 1923–1940

INDUSTRY	PERCENTAGE INCREASE IN AVERAGE HOURLY EARNINGS
1. Chewing and Smoking Tobacco and Snuff	69.2
2. Chemicals	64.1
3. Rayon	56.4
4. Petroleum Refining	53.4
5. Iron and Steel	45.5
6. Rubber Tires and Inner Tubes	44.6
7. Glass	42.7
8. Cigarettes	40.0
9. Paints and Varnishes	37.2
10. Motor Vehicles, Bodies, and Parts	36.5
11. Pulp	35.8
12. Agricultural Implements	33.5
13. Cane-Sugar Refining	32.6
14. Knit Goods	29.5
15. Canning and Preserving	28.6
16. Slaughtering and Meat Packing	26.8
17. Leather	25.8
18. Cement	25.7
19. Newspaper and Periodical Printing and Publishing	25.3
20. Steam Railroads (Class I)	22.4
21. Paper	22.2
22. Woolen and Worsted Goods	22.0
23. Fertilizers	20.9
24. Bread and Other Bakery Products	19.6
25. Cigars	17.0
26. Flour and Other Grain Mill Products	15.8
27. Primary Smelters and Refineries	14.5
28. Cotton Goods—Cotton Growing States	13.0

TABLE 7 (*continued*)
Percentage Increase in Average Hourly Earnings, 1923–1940

INDUSTRY	PERCENTAGE INCREASE IN AVERAGE HOURLY EARNINGS
29. Lumber and Timber Products	10.7
30. Clay Products and Nonclay Refractories	6.1
31. Bituminous Coal	4.5
32. Cotton Goods—New England States	3.3
33. Furniture	3.1
34. Ice Cream	−1.4
35. Boots and Shoes	−3.7

The dispersion in Table 7 suggests that a theory of the interindustry movement of wage structure must include other factors than changes in productivity and output or employment. Three additional factors are suggested for consideration: the proportion of labor costs to total costs in the industry, the competitive conditions in the product market for the output of the industry, and the skill composition of the industry. While these factors may be in part directly related to changes in productivity and output, their separate influences on patterns of wage movement should be distinguished.

The smaller the proportion of labor costs to total outlays, other factors being the same, the more likely for wage and salary rates to rise relative to the average of all industries. Wage and salary earners will have greater bargaining power, and enterprises will tend to offer less resistance to increases.

The more competitive the product markets for the output of the industry, the more difficult for wage earners to capture the gains of increased productivity. The competitive conditions in the product markets for Boots and Shoes, Cotton Textiles, Bituminous Coal, and Furniture undoubtedly influenced the pattern of wage changes in these industries.

The skill composition of the industry, as it is altered through time by technological change, will affect seriously the pattern of movement in average hourly earnings. Two industries may have the same rate of increase in output per manhour, but the wage patterns will diverge because the average level of skill, or the occupational composition, of the work force in the industries will be changing in different directions.

The inter-industry pattern of changes in average hourly earnings over substantial periods is to be explained fundamentally in terms of the following factors: change in productivity, change in output, proportion of labor costs to total outlays, competitive conditions in the product market, and the changing skill and occupational content of the industry. Wage and salary rates would be expected to increase most where productivity and output increase most, where labor costs are a small percentage of total costs, where the enterprises are in strong bargaining power with the purchasers of their output, and where technical change operates to increase the skill and raise the occupational rating of employees. The converse indicates situations where wage and salary rates are to be expected to decline relatively.

This theoretical framework for inter-industry wage movements appears to give no distinctive place to the role of labor organizations. The discussion in the section on wage leadership indicated that labor organizations can have a decisive influence on the wage and salary level. Their influence on the structure of wages cannot be ignored. The data in Table 7 do not suggest that the role of unionization has been distinctive or uniform. A careful statement would suggest that the five factors indicated above establish the main outlines and tendencies for variations in inter-industry wage relationships. These factors are important realities (although not the full story) with which the parties to collective bargaining must grapple. They tend to set practicable limits to bargains. When account is taken of all the factors which must be taken into account by the parties to collective bargaining, the final wage bargain may diverge, even over long periods, from that indicated by the theoretical framework suggested above. While judgments will differ, the present observer is of the opinion that in most cases the divergence will not be large. The factors indicated in the theoretical model effectively condition the bargaining process.

VI. SUMMARY

It may be helpful to highlight the previous discussion by a series of propositions. These points must be interpreted within the context developed in previous sections.

(1) The benefits of higher productivity have been shared over long periods by a combination of lower prices and higher wage rates. There have also been significant changes in quality.

(2) Wage rates show some tendency to increase most in that group of industries in which output, employment, and productivity increase most. Wage rates increase least in those industries in which output, employment, and productivity increase least. This generalization is a useful and valid summary.

(3) The relationship between changes in productivity and wage rates, however, is not unique since a great many other factors affect wage-rate movements among industries.

(4) The location of wage leadership in the system, as between expanding and contracting sectors, can materially affect the rate of rise in the average wage level.

(5) The argument for or against an increase in wage rates in a particular industry or firm on the grounds of productivity would appear much less valid than normally assumed. The standard of productivity by which the parties are admonished to settle their disputes is an empty slogan as judged by the historical pattern of wage and productivity changes for any particular wage bargain.

(6) Wage differentials among industries appear to have been surprisingly flexible. In a seventeen-year period there have been marked changes in the relative position of wages in expanding and contracting industries.

(7) The argument that wages should be increased in an industry to preserve its relative position, or that they should not be increased because wages in a particular industry are at parity with

other industries is dangerous, for it neglects the highly dynamic character of wage differentials among industries.

(8) The inter-industry variations in wages over substantial periods are to be explained in terms of these factors: changes in productivity and output, the proportion of labor costs to total costs, the competitive conditions in the product market for the output of an industry, and the changing skill and occupational content of the work force of an industry. These factors will tend to set limits to the bargaining over the relative position of the wage and salary rates of the employees of an industry.

VII

Exchange Practices and the Fund

BY

ALICE BOURNEUF *

I. INTRODUCTION

One of the primary objectives of the International Monetary Fund is to promote a balanced growth of world trade, and thus help maintain high levels of employment and income. The Fund will work toward this objective partly through its supervision of exchange rates and through making its resources available to meet temporary deficits. It will also exercise direct supervision over the exchange practices of members. One of the stated purposes of the Fund is to "assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade."

Certain provisions in the Fund Agreement govern the exchange practices which member countries are permitted in normal circumstances. The Fund may at any time approve the adoption of practices not normally permitted, however, and members are free to impose restrictions in the abnormal case of a scarce currency. Although the Fund Agreement is now in force, it will be impossible for some time to judge by experience what exchange practices are permitted in normal circumstances since special provi-

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* The views expressed in this chapter do not in any way represent views of the International Monetary Fund. The chapter was written before the author joined the staff of the fund.

sions allow for the maintenance of all types of exchange restrictions in the transition period. It is possible, however, even now to analyze the provisions governing the exchange practices permitted in normal circumstances with a view to determining to what extent they provide for a multilateral system of payments and the elimination of exchange restrictions.

For purposes of analysis, it is helpful to distinguish between two broad types of exchange restrictions: restrictions on payments as such and restrictions on transfers or convertibility.

It is important to know whether members of the Fund will normally be permitted to use exchange regulations to prevent their residents from making payments in some currency for current imports of goods and services, i.e., will normally be permitted to impose *restrictions on payments as such.* It is also important to know whether members of the Fund will be permitted to impose restrictions on the currency in which payment is made, and on the use which can be made of currency received in payment. Such restrictions may take the form of the importing country permitting payments to be made in the first instance only in its own currency, blocking the use of amounts of its currency held by other members, or permitting its conversion into only one or a few other currencies. Restrictions of this second type may be broadly referred to as *restrictions on transfers or convertibility.* The first type of exchange restrictions leads directly and immediately to a decrease in a member's current imports. The second type of restrictions may not directly decrease a member's imports, but may prevent the exporting country from conducting its trade on a multilateral basis, i.e., from using the proceeds of current exports to one member to finance current imports from another member.

II. EXCHANGE PRACTICES NORMALLY PERMITTED

There are two provisions in the Fund Agreement which relate to the obligations of members with respect to exchange restrictions in normal circumstances. One is a general clause under the heading of "Avoidance of Restrictions on Current Payments," which may be referred to as the "general provision." The other is under the heading "Convertibility of Foreign Held Balances," and will be referred to as the "convertibility provision."

General Provision

The general provision, which applies except under certain abnormal conditions such as that of scarce currency or that in which restrictions are imposed with the approval of the Fund, obligates members not to "impose restrictions on the making of *payments and transfers* for current international transactions." [1] The obligation not to impose restrictions on the making of *payments* presumably means that monetary authorities can not use exchange regulations or devices to prevent their residents from making payment for current imports. Members of the Fund are assured that other members can not normally use exchange devices actually to prevent current payments to them, and thus directly reduce their exports of goods and services.[2] Restrictions of the first type described above are clearly not permitted.

But this obligation by itself would not rule out harmful ex-

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[1] Article VIII, Section 2, Fund Agreement.

[2] The use of other devices, such as quantitative restrictions, quotas, tariffs, etc., to achieve similar purposes is not in any way affected by the Fund Agreement. Such devices will be under the supervision of the proposed International Trade Organization. It is difficult to draw the line between quantitative and exchange restrictions. Quantitative import restrictions, however, are usually considered to be restrictions imposed on the amount, not the value, of specific commodities which may be imported. A regulation providing that payments to a given country (or to all countries), for one commodity or for all commodities, may not exceed a given value in a given time period, whether in local currency or in foreign currency, is usually considered to be an exchange restriction.

As far as invisible items are concerned, such as tourist, freight, or insurance services, or gifts, it is difficult to imagine the imposition of quantitative restrictions so defined. Any limitation on the use of such foreign services or the making of gifts would presumably restrict payments for such items. It would be in value terms normally, and would be considered as an exchange restriction rather than a quantitative restriction. The regulation probably would not prohibit travel abroad as such, or the transport of goods in foreign vessels, but would prohibit paying more than a certain amount for such services. Quantitative restrictions on imports, on the other hand, actually forbid the physical importation of the change practices. Members could permit payments only in their own currency, and then restrict the use which other members could make of balances so acquired. The general provision, however, also obliges members not to restrict *"transfers."* The word "transfers" is difficult to interpret precisely, but it implies surely that if payment is made in the first instance in the importing member's currency, the exporting member must be permitted to transfer the amount into some other currency. A more precise interpretation of the word "transfers" may be possible after examination of the convertibility provision.

Convertibility Provision

The convertibility provision is much more detailed. It raises a number of difficult questions of interpretation, but the currency into which a member must permit amounts paid to other members to be transferred under this provision is clear. Except under certain conditions, a member is assured that it can convert balances of another member's currency, recently acquired as a result of current transactions, into *its own currency*. This may be described as assuring a member the right to repatriate the proceeds of its exports.

The provision may be more fully explained as follows. The monetary authorities of any member B are obliged, except under certain conditions, to purchase from the monetary authorities of any other member A, balances of B's currency recently acquired by A as a result of current transactions or needed by A to make payments for current transactions.[3] Country B has the option of buying the balances from A with gold or with A's currency. Country B is not obligated to make such purchases if B is impos-

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goods beyond certain amounts. Any person who proves he has been licensed to import the goods can not be prevented by quantitative restrictions from paying for them.

[3] The provision implies the right to convert balances *needed* for current payments, irrespective of whether or not they were recently acquired as a result of current transactions. This implication is difficult to understand, and may in fact be nullified by the proviso that the provision does not interfere with any member's right to restrict capital transfers.

ing exchange restrictions on current transactions with the approval of the Fund, if B is ineligible to buy foreign currencies from the Fund for any reason, or if A's currency is "scarce" in the Fund.

The convertibility provision may furnish an important clue to an interpretation of the general clause. The requirement which the convertibility provision imposes upon a member is limited to its permitting the conversion of balances into the currency of the exporting country. This requirement only applies when a member is in the comparatively favorable position of being able to buy the exporting member's currency, needed to make the conversion, from the Fund. The general provision applies not only under these favorable conditions but also when a member is not eligible to buy currencies from the Fund at all. It seems reasonable, therefore, to assume that the general provision does not require convertibility into any currency other than that of the exporting member. Furthermore, if the general obligation were to permit free convertibility into any other member currency, or free exchange markets, the special convertibility provision would be obviously unnecessary and meaningless. If the general obligation is limited to permitting transfer into the *exporting* member's currency, the special convertibility provision adds little, but at least it fulfills the function of explaining what is meant by the general obligation not to restrict transfers.

In summary, then, it appears that while the general provision prevents restrictions on *payments* it does not prevent certain restrictions on the *transferability* or convertibility of balances. Noninterference with free exchange markets, which would clearly guarantee a multilateral system for current payments, is not required. While absolute blocking of the proceeds of current exports is prohibited, a member need permit the transfer of recently acquired balances only into the exporting member's currency. It is important to analyze whether this guarantees a multilateral system for current payments.

III. THE REPATRIATION PRINCIPLE AND MULTILATERALISM

If a member is guaranteed in normal circumstances under the Fund Agreement the right to repatriate the proceeds of current exports, i.e., the right to be paid in its own currency, will this enable it to use the proceeds of current exports to any one member to finance current purchases from other members? Does the Fund, in other words, provide in general for a multilateral system of current payments? The following analysis indicates that in the general case the right of repatriation does assure multilateralism, but that in certain more or less abnormal cases it does not. The answer depends in part on whether a member is paid (1) in its own currency purchased *outside the Fund,* or (2) in its own currency purchased *from the Fund.*

General Cases

If country B makes payment to A for current imports in A's currency purchased *outside the Fund,* i.e., in the exchange market, country A can generally be assured that the payment will enable it to finance current imports from other countries. In the process of obtaining A's currency, country B will really be making payment to A in some currency which A needs for current payments. Country B may purchase A's currency with her own currency in the exchange market from residents of A who need B's currency for current payments. Or B may purchase A's currency from residents of other members who have received payment for current exports to A in the first instance in balances of A's currency which they do not need, and would, if necessary, ask A to convert into their own currencies. Another possibility is that B may use balances of A's currency already paid to residents of B for current exports. In each case it is clear that the demand for A's currency by B enables A to pay for current imports from B or from other countries.[4]

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[4] The assumption is that A can control capital transfers, and thus prevent the

If B makes payment to A in A's currency purchased *from the Fund*, it is again clear that in the general case A will be enabled thereby to finance current purchases from B or other countries. In this case the essential fact is that the decrease in the Fund's holdings of A's currency will in general enable A to obtain foreign currencies from the Fund. Members purchase foreign currencies from the Fund with their own currencies, and limits are set on the increase over a given period of time in the Fund's holdings of a member's currency. Country A's drawing privileges are automatically increased, therefore, if its currency is purchased from the Fund by other countries. The quantitative limits on A's purchases of foreign currencies from the Fund, which are established in the Fund Agreement, are in terms of the net change over a given period of time in the Fund's holdings of A's currency.

Abnormal Cases

It is important to consider, however, the more or less abnormal cases in which payment in a member's own currency does not provide for a fully multilateral payment system. The obvious exception is the "scarce currency" case, whether payment is made in currency purchased from the Fund or outside the Fund. This case, however, is one which is clearly recognized as abnormal. The declaration that a currency is "scarce" is a sign that that currency is outside the multilateral system.[5] Payments from B to A in A's currency will not enable A to finance purchases from a third country the currency of which is scarce. The scarce cur-

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payment from country B from financing an export of capital rather than current imports.

[5] The convertibility provision, or repatriation principle, gives added protection to a country amply supplied with the scarce currency. If B had a larger supply of the scarce currency than was currently demanded by her residents, it is not clear that she could limit its use to meeting the demands of her own residents under the terms of the scarce currency provision, although this was probably what the drafters of the provision had in mind. Country B could, however, take advantage of her right to prevent free exchange dealings, as implied in the convertibility provision, and insist on converting balances of B's currency held by A into A's currency through the Fund, rather than allow A to purchase the scarce currency with B's currency.

rency will not be offered on the market, by B or by any other country, in exchange for A's currency—and A is not likely to be able to make payments to the scarce currency country in the first instance in its own currency. Payment to A in A's currency purchased *outside the Fund*, therefore, will not enable A to finance purchases from the scarce currency country. Country A's ability to finance purchases from the scarce currency country will not be increased if A is paid in its own currency purchased from the Fund. And payments to A in A's currency purchased from the Fund will not increase A's ability to obtain the scarce currency *from the Fund*, since the Fund will limit each member's purchases of the scarce currency from the Fund.

The other exceptions to multilateralism are less obvious, and may require more consideration. These exceptions occur only when Country B makes payment to A in A's currency purchased *from the Fund*. The departure from multilateralism arises if A is not able to obtain equivalent amounts of foreign currencies from the Fund to pay for current imports, i.e., if A is prevented, by considerations other than the quantitative limits on the Fund's holdings of A's currency, from purchasing currencies from the Fund. There are conditions under which this may happen. Country A may be ineligible to use the Fund because it is permitting a large or sustained outflow of capital. Or the Fund may believe that conditions in Country A do not permit use of the resources of the Fund in accordance with its purposes. For example, A may have a balance of payments deficit due to a long-term reconstruction program. Members may be declared ineligible to use the Fund for such reasons or because they have failed to fulfill any of their obligations under the Fund Agreement, e.g., with respect to exchange rates.

In these cases, in which purchases of A's currency from the Fund do not automatically enable A to purchase equivalent amounts of foreign currencies from the Fund, country A may be forced, through the net reduction in the Fund's holdings of A's currency, to use the proceeds of current exports to repay past borrowing from the Fund or to accumulate future drawing privileges. Country A, not only is unable to use proceeds of its net exports to B to pay for current imports from other countries, but, in fact, is forced to use the proceeds to improve its net position vis-a-vis the Fund.

These cases should no doubt be given special attention by the Fund management. When a member is unable to draw on the Fund, it is likely to be in special need of foreign exchange. It will quite certainly have a balance of payments deficit unless its ineligibility to use the Fund is due to the failure to fulfill some specific obligation. If other members pay for any large share of the ineligible member's exports by purchasing that member's currency from the Fund, rather than outside the Fund, its balance of payments difficulties will be greatly increased. In some cases the Fund may welcome the added pressure put on the ineligible member to take corrective action, e.g., to curb capital flights. In other cases, it may wish to prevent use of the Fund by other members from adding to the ineligible member's difficulties.

There are various ways in which the Fund might conceivably prevent a member from being subjected to additional balance of payments pressure in this way. The Fund might take the position that a member ineligible to "use the Fund" can always replace such amounts of its currency as are currently drawn from the Fund by other members, but there might be some difficulty in supporting this interpretation. Or the Fund might refuse to sell the member's currency to other members; but it is difficult to see how it would do so under the Agreement, since it would not be possible to declare the currency "scarce." If no other solution offered, the Fund could perhaps arrange informally not to sell the member's currency.

To summarize this section, the repatriation principle will in general provide a multilateral system of payments, whether a member is paid in its own currency purchased in the market or purchased from the Fund. In the clearly abnormal case of a scarce currency, there is obviously an exception to complete multilateralism. Further exceptions to multilateralism may arise in certain other more or less abnormal cases involving a member's ineligibility to use the Fund, when a member receives payment for its net exports in its own currency purchased from the Fund. The Fund may or may not wish to avoid this result. If it does wish to do so, it may be able to handle the situation in an informal way.

As a practical matter the problem may solve itself. Country B may not exercise its right to pay A in A's currency—whether purchased outside the Fund or from the Fund. The practical possibilities are discussed in the next section.

IV. REPATRIATION PRINCIPLE: PRACTICAL ASPECTS

It may be worthwhile to consider whether in practice members of the Fund will insist on their right to restrict the convertibility of their currencies to the full extent consistent with the application of the repatriation principle. This question must be considered on the assumption (1) that the Fund does not adopt a bilateral policy—in the sense that it will only provide A's currency for the purpose of making payments to A—and (2) on the assumption that the Fund does adopt a bilateral policy. Whether or not the Fund adopts a bilateral policy is important because a member may wish to meet a certain balance of payments deficit by drawing on the Fund rather than by using its own reserves.

(1) If the Fund does not adopt a bilateral policy, members are not likely to invoke the repatriation principle except in more or less abnormal cases. If the Fund is willing to provide country B with any currency it needs to meet its deficit with A, country B need not in general insist on making payments to A in A's currency.

Country B may of course refuse to make payments to A in a currency which has been declared scarce, but this does not constitute an application of the repatriation principle. It is conceivable also, however, that country B might have previously accumulated balances of A's currency which it was not free to withdraw or use except for the purpose of making current payments to A. This abnormal case involves restrictions on the use of accumulated balances of a type which A is likely to impose, if it wishes to encourage B to discriminate in favor of purchases in A as compared to other countries. Unless either the Fund or the International Trade Organization is permitting discriminatory restrictions on current transactions, this type of situation is not likely to be important. But there is no guarantee that such discriminatory restrictions may not be permitted even in comparatively normal times.

If these are the only important cases in which members are likely to invoke the repatriation principle, it may be proper to assume that the majority of members will not do so. In spite of the less rigid requirements of the Fund Agreement, the majority of members may perhaps permit free exchange markets.[6]

(2) If the Fund did adopt a bilateral policy, members of the Fund might well invoke the repatriation principle as a general rule. The bilateral policy would mean that the Fund would make a given currency available to a member only to the extent that it had a current deficit in its dealings with the country of that currency.

In this case any member wishing to meet deficits by drawing on the Fund rather than on its own reserves would see to it that payments were made either in the first instance in its own currency, or only in the currency of the exporting country. It would presumably do so generally because it would never know when or to what extent it might wish to draw on the Fund. This might be the case even though the member knew that its major deficit tended to be with one country, and the currency of that country seemed likely to become a "scarce" currency. In this case the member would still want to be able to finance its deficits with other countries through the Fund.

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[6] A special case might be drawn up as follows: Country B might invoke the repatriation principle, if it were ineligible to use the Fund and if it expected A to invoke the repatriation principle. Country B might insist on its right to pay in A's currency if it had balances of A's currency, recently acquired as a result of current transactions, and expected A to insist on its right to convert them into B's currency purchased from the Fund. If B were ineligible to use the Fund, for other than quantitative reasons, it would then find that its exports to A were reducing its indebtedness to the Fund, or increasing its future drawing rights on the Fund, rather than enabling it to finance current imports. But in this case some abnormal situation must exist to lead Country A to invoke the repatriation principle.

A practical judgment on the extent to which members are likely to invoke the repatriation principle depends, then, on the likelihood of the Fund adopting a bilateral policy. This question is considered in the next section.

V. A BILATERAL FUND?

What is the possibility that the Fund will adopt a bilateral policy? It might do so if one currency was tending to become scarce in the Fund, while certain members were accumulating balances of this currency, and their currencies were not being drawn from the Fund. It has been suggested that this will happen because members will consider drawing privileges on the Fund less valuable than reserves of gold or of strong currencies. As a result they might try to use the Fund rather than their reserves to meet deficits, and they also might try to accumulate reserves rather than Fund-drawing privileges when they had a favorable balance. The whole question of Fund privileges as compared to independent reserves must be examined.

Fund Privileges vs. Reserves

Fund privileges should not be regarded as equivalent to reserves. Members can use only a certain amount of their drawing privileges each year without special permission. Also, there are a number of specific purposes for which the Fund may not be used according to the Articles of Agreement. Even more important, borrowing from the Fund must be in accordance with the general purposes of the Fund. Members are expected to borrow for short periods to give them time in which to take measures to balance their international transactions. Finally, a member country may fail to fulfill some of its obligations under the Fund Agreement, for example, with respect to exchange rates or exchange controls, and be declared ineligible to use the Fund. This is an extreme possibility, but under such circumstances there may be an extended period of time before a member is declared eligible again, or before a member is able to withdraw its subscription to the Fund. During such a period Fund-drawing privileges are obviously of no use.

Any country, on the other hand, is free to use its own gold and dollar reserves for any purpose. It may use reserves to meet an outflow of capital, to finance long-term reconstruction needs, or to pay war debts. Also, it may use gold to meet a deficit which gives evidence of becoming chronic, without taking measures to correct the situation. For example, a country experiencing a rapid inflation may use reserves to meet the deficit which results. The Fund, on the other hand, might refuse assistance unless drastic steps were being taken to stop the inflation.

The possibility that the dollar may become scarce in the Fund is an added reason why the monetary authorities of most countries will consider drawing rights on the Fund as less valuable or desirable than gold or dollar reserves. This possibility is much less than is ordinarily supposed, at least on the basis of present membership in the Fund. The Fund will begin operations with gold, United States dollars, and Canadian dollars equal to 76 per cent of the normal borrowing privileges of all members other than the United States and Canada. Furthermore, it appears that the United Kingdom may not use its drawing rights in the Fund, which means that the percentage of gold, United States dollars, and Canadian dollars to the total drawing rights which will probably be exercised may be much higher. In addition, the repurchase and gold-sale provisions will tend to replace the Fund's holdings of dollars and gold.

Use of the Fund Privileges rather than Reserves

It has been argued that because of the preference for gold and dollar reserves as compared to Fund-drawing rights member countries will rush to use the Fund rather than their own reserves in meeting such deficits as do occur. This, in turn, would increase the possibility of dollars becoming scarce in the Fund. The argument implies that members have a clear alternative and are quite free to use one or the other as they see fit. Actually, one of the repurchase provisions requires all members, which have reserves in excess of their quotas, to draw on their reserves at the same rate year by year at which they borrow from the Fund. Since countries with 83 per cent of Fund quotas or borrowing privileges have reserves in excess of their quotas, and countries with 36 per cent have reserves more than twice their quota, most of the borrowing from the Fund for some time to come will have to be accompanied by equivalent use of reserves by the borrowing country.[7] Most members, then, will not be in a position to use the Fund rather than their own reserves.

The other possibility is that members might rush to use the Fund *pari passu* with their reserves, by permitting deficits of a size they would not otherwise permit. It is true that the monetary authorities of an individual member country may adopt policies which lead to large deficits, knowing that they will be able, for a time at least, to meet half the deficit through the Fund. But if the policies of the member country may be expected to result in a continuation of this deficit, the Fund must discuss with the country other means of meeting or eliminating the deficit. Member countries will not be allowed to use the Fund for unsound purposes, i.e., to meet deficits which give evidence of becoming chronic, while taking no steps to overcome the deficit. Whenever Fund resources are used, the Fund must insist they are intended to be used on a temporary basis, and, therefore, must insist on speedy repayment or elimination of indebtedness to the Fund. If the Fund insists in general on prompt repayment, there remains little reason why a country should rush to use its Fund privileges, since it will shortly have to use reserves to repay the Fund.

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[7] This statement is based on data on gross gold and dollar reserves. The Fund concept of monetary reserves is a net concept.

On the whole, therefore, there is no great danger that the coexistence of Fund drawing privileges and gold reserves will lead to rash or speedy use of the Fund.

Accumulation of Reserves rather than Fund Privileges

Is it likely that a scarcity of dollars may arise partly from the fact that certain countries are accumulating dollars while their currencies are not drawn from the Fund? Member countries may try to accumulate reserves rather than drawing privileges on the Fund. If a member has a favorable balance on the whole, it may be able to do so.[8] If it is not indebted to the Fund on account of past operations, it could accumulate reserves to the full amount of its favorable balance if it received payment in reserves rather than in its own currency purchased from the Fund. If it is indebted to the Fund, it would be required to use half the increase in reserves to repay past borrowing from the Fund.

If there were a serious effort on the part of member countries to receive payment in reserves rather than in increased drawing privileges, the whole Fund mechanism might be weakened. Currencies of certain countries would remain in the Fund, even though those countries had favorable balances of payments, while other currencies, e.g., dollars, would be drawn from the Fund to make payments to such countries. Countries with favorable balances on the whole, which were not indebted to the Fund, could accumulate dollars. The danger of dollars becoming scarce in the Fund would be increased. It is doubtful, however, that there will in fact be enough countries, other than the United States, with large favorable balances of payments to make this a serious problem for the next few years.

[8] If a member does not have a favorable balance on the whole, it would not gain by receiving payment in gold or dollars rather than in its own currency purchased from the Fund. Purchases of its currency from the Fund would enable it to buy other currencies from the Fund. If it is accumulating gold and dollars, on the other hand, it cannot use the Fund.

Possibility of Bilateral Fund

If dollars become scarce in the Fund and dollars drawn from the Fund are increasing the reserves of countries other than the United States, the Fund may decide to adopt a bilateral policy. Members might then forbid free exchange transactions, and invoke the repatriation principle in order to assure their ability to meet deficits by drawing on the Fund.

The adoption of a bilateral policy by the Fund would not necessarily prevent indirect use of Fund dollars to meet payments to countries other than the United States. Members might be willing to use their own reserves of gold or dollars to meet deficits with other countries, because they could obtain dollars from the Fund to meet their deficit with the United States. But the Fund could conceivably refuse to make dollars available to a member under these circumstances. This would be rather a drastic policy for the Fund to adopt. This policy would be even more difficult to implement than the simple bilateral policy which itself would require roughly accurate balance of payments forecasts.[9]

Conclusion

On the whole the danger that the dollar will be scarce in the Fund while dollars are drawn to meet payments to, and increase the reserves of, countries other than the United States, is not great. It is not likely that the Fund will adopt a bilateral policy. The Fund could do so, however, if necessary. Members would then tend to invoke the repatriation principle, and favorable balance countries would be forced to take payment in their own currencies drawn from the Fund.

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[9] A country which was very anxious to obtain payment for its excess exports in gold or dollars might take other measures to achieve its ends, even if the Fund did adopt a bilateral policy. It might use political bargaining weapons. Or it might offer a high price for foreign gold to induce sales of gold to it. However, the price paid by a member for gold cannot exceed par by more than a margin to be prescribed by the Fund. The Fund can prevent sales of gold to members for their currencies by itself offering the maximum price, since members are obligated to sell gold to the Fund for foreign currencies, if they can do so with equal advantage. In this way the Fund would be able to use the currency of any member which other members wished to purchase with gold, and such members would receive payment through the Fund. Since most members must use their reserves at the same rate that they draw on the Fund, the Fund could obtain large amounts of gold in this way.

VI. SUMMARY

(1) The Fund does not permit restrictions on current payments as such. Members seem to be assured, however, only that they can receive payment in their own currency. This principle may be called the repatriation principle. This means that in general free exchange markets or free convertibility of currencies is not obligatory.

(2) Even though members are only assured of the right to receive payment in their own currency, the system of payments will in general be multilateral. That is, members will normally be able to use the proceeds of current exports to one member to finance current purchases from other members. In certain cases, involving the receipt by a member of payment through the Fund, and ineligibility on its part to use the Fund, the multilateral system will be interfered with. The Fund may wish to consider special action in these cases.

(3) Members of the Fund are not likely in general to insist on their right to make current payments only in the currency of the exporting country, that is, to invoke the repatriation principle, unless the Fund adopts a bilateral policy in its dealings with members.

(4) The Fund might possibly adopt such a bilateral policy if certain currencies were becoming scarce in the Fund, and the currencies of other countries were not being drawn from the Fund, even though they had favorable balances of payment on current account. There appear to be good reasons, however, for believing that the danger of such developments is not great.

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